THE PENNY CYCLOPÆDIA

OF

THE SOCIETY

FOR THE

DIFFUSION OF USEFUL KNOWLEDGE.

VOLUME XVI.

MURILLO——ORGAN.

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MURILLO, BARTOLOMEO ESTEBAN, the most eminent artist of the school of Seville, and the most distinguished colourist of the Spanish painters, was born at Seville in the year 1618. As he manifested at a very early age an inclination to painting, he was placed under his uncle, Juan del Castillo, an artist of merit, whose favourite subjects were fairs and markets, and whose pupils, Alonso Cano, Murillo, and Pedro Moya, rank as the best Andalusian artists. Under him Murillo made rapid progress, and painted several pictures while he remained with his uncle. After leaving him he continued to improve in drawing as well as in painting. For some time he painted in the Florentine style, which then prevailed in Spain, and several works of this his first period are still preserved at Seville. In order to improve himself in drawing, he was on the point of going to England to see Vandyck, when he heard of the death of that great master. He then applied with great diligence to the painting of small pictures of saints, for the trade with America, by which he obtained funds sufficient to undertake, in 1643, a journey to Madrid. Here he derived great advantage from the instruction of his countryman Velazquez, who likewise obtained for him permission to copy the master-pieces of Titian, Rubens, Vandyck, and Ribera, in the royal collection. Returning to Seville in 1645, he excited general admiration by his paintings in the convent of St. Francis. They were in the style of Spagnoleto (José Ribera) and Velazquez, then unknown at Seville, and procured him many commissions. He painted several historical pictures for the king of Spain, which gained him great reputation in his own country, and, being sent to Rome as a present to the pope, so highly pleased the Italians, that they called him a second Paul Veronese. He likewise painted many grand altar-pieces for the churches and convents in Madrid, Seville, Cordova, Cadiz, and Granada. Among these are eight large pictures representing the works of Mercy, for the church of St. George in the hospital 'De la Caridad' of Seville, which are distinguished for their admirable composition and force of colouring. Other equally excellent works adorned the church of Los Venerables and the Capucin convent, for which latter he painted twenty-eight pictures, which were afterwards sent to America. He was engaged on an altar-piece representing the marriage of St. Catherine, for the Capucin convent at Cadiz, when he met with an accident on the scaffolding, from which he never recovered, and he died at Seville, on the 3rd of April, 1685.

But though Murillo was thus eminent in the higher departments of the art, his favourite subjects were beggar boys as large as life engaged in various amusements, which he generally designed after nature. His pictures of such subjects are highly esteemed for their merit, and may be seen in the collections of the English nobility; but there are numberless copies. Murillo excelled likewise in portraits and landscapes. His works are distinguished by their striking character of truth, nature, and simplicity; by the entire absence of the servility of imitation; and by the delicacy of his touch, and the mellowness of his colouring, which in fact seem perfect in every particular. Among his finest pictures are 'Moses striking the Rock,' and 'Christ feeding the Five Thousand,' in the convent of St. Francis, at Seville; and 'St. Antony of Padua,' in the cathedral of that city and in the National Museum at Madrid. Many of his works are in France, particularly in the collection of Marshal Soult,* and in the collections of the English nobility and gentry. The Dresden Gallery has a fine 'Virgin and Child' by his hand. Several of his pictures are at Munich, and others at Vienna, in the possession of Prince Esterhazy. By the collection of several Murillos from the convents of Seville, a museum has recently been formed in the cathedral of that city; and there are many more in the National Museum at Madrid. The picture which Murillo preferred to all his other works was that of 'St. Thomas de Villa Nueva distributing Alms to the Sick and the Poor.' This, we presume, is the picture in the possession of Mr. Wells, of which Dr. Waagen says, 'This fine picture was formerly in the church of the Franciscans at Genoa. The subject was a peculiarly happy one for Murillo. In the head of the saint, in which priestly dignity and gravity are admirably expressed, he proves his ability in treating such religious subjects from the legends of the monkish saints. The cripples and the sick afforded him, on the other hand, an ample field to show his skill in representations from common life, which we so highly admire in his beggar boys.' Dr. Waagen describes likewise another picture of the same subject, 10 feet high and 6 feet wide, now in Lord Ashburton's collection, purchased by his lordship of General Sebastiani, and which was formerly at Seville. We refer to Dr. Waagen's work on 'Arts and Artists in England' for descriptions of the numerous pictures by Murillo in our English collections. Murillo raised the art of painting in Spain not only by his own works, but by founding an academy at Seville, of which he was president from the year 1660 till his death. (Cean Bermudez, *Diccion. de Profes. Españo. de Bellas Artes*; Ponz, *Viage de España*; *El Artista*, 1835; *La Revista de Madrid*, Enero, 1839.)

MURPHY, ARTHUR, a dramatic and miscellaneous writer, was born near Elphin, in the county of Roscommon, Ireland, December 27, 1730. His father was a merchant in Dublin. In 1740, Arthur Murphy was entered at the college of St. Omer, where he remained nearly seven years, and, on his return to Ireland, passed two years in a merchant's counting-house at Cork. From thence he came to London, and obtained a situation as clerk in a banking-house, shortly after which he commenced his career as a public writer. On the 21st of October, 1752, he started 'The Gray's Inn Journal,' a periodical in the style of the 'Spectator,' which he carried on to October 12th, 1754. On the 18th of the same month he tried his fortune as an actor on the stage of Covent Garden, and in the character of Othello. His success was but moderate, and after a second season, during which he acted at Drury Lane, he quitted the boards for ever, and resumed his former occupation as a writer by commencing a periodical political journal called 'The Test.' He also began to study the law, but was refused admission to the societies of the Temple and of Gray's Inn on the ground of his having been an actor. He succeeded finally in obtaining admission to Lincoln's Inn, was called to the bar, appointed a commissioner of bankrupts, and died at Knightsbridge, June 18th, 1805, in the seventy-fifth year of his age. His principal works

* Two of these, the 'Prodigal Son' and 'Abraham and the three Angels' have been purchased by the Duke of Sutherland.

[illegible]lation of Tacitus, which is in a diffuse style, [illegible] somewhat loose and inaccurate performance; the [illegible] Fielding (whose works he edited), Johnson, and Garrick; and upwards of twenty dramatic pieces. The [illegible] esteemed of his dramatic pieces are the comedies of 'The Way to keep him,' 'All in the wrong,' 'Know your own Mind,' and 'Three Weeks after Marriage.' His plays, poems, and miscellanies, in 7 vols. 8vo., edited by himself, were published in 1786.

MURRAY RIVER. [AUSTRALIA.]

MURRAY, W. [MANSFIELD, LORD.]

MURRAY, JAMES STUART, EARL OF, known in Scottish history by the name of the 'Good Regent,' was the eldest of three illegitimate brothers, children of King James V. His mother was the Lady Margaret, daughter of John lord Erskine of Mar, a nobleman of rank and influence at court, and one of those to whom the custody of the king, when an infant, had been committed.

He is supposed to have been born about the year 1533, but the precise time of his birth is not known, nor any particulars of his early life, except only this, that when but a few years old, his father made him prior of St. Andrew's, with all the revenues of that rich benefice. He afterwards acquired also the priory of Pittenweem, and, after obtaining a dispensation from the holy see to hold three benefices together, that of Mascon in France in commendam; and in 1544 he took the oath of fealty to Pope Paul III. In 1548 however he gave proof of that intrepidity and military genius for which he was afterwards so distinguished. This was on occasion of the descent into Scotland by the lords Grey de Wilton and Clinton. When the fleet of the latter landed at St. Monan on the coast of Fife, the lord James (as he was then called) collected a little band as determined as himself, and, placing himself at their head, attacked the invaders and drove them back to their ships. Shortly before this he had been in France, having gone thither in the retinue of his youthful sister Queen Mary, when it was resolved she should be sent over to the Continent for her education; and at different times afterwards we find him again abroad. He was also present at Mary's marriage with the dauphin of France; and was soon afterwards deputed to carry to the latter the crown and other ensigns of royalty. Circumstances occurred however in Scotland which prevented the execution of this appointment: the Reformation was now rapidly diffusing itself among all classes of the community, and dissolving in its mighty progress the nearest and tenderest ties. In these struggles the prior of St. Andrew's joined the reformers, or, as they were called, the *congregation*, among whom, by his courage and military skill, the success of his undertakings, the sanctity or rather austerity of his character, and the bluntness of his manner, aided by the advantages of birth, countenance, and person which he possessed, he gradually acquired a very high degree of consideration. The queen regent (to whom he was opposed) of course endeavoured to destroy his influence, representing him in particular as an aspiring ambitious man who, under pretence of a reformation in religion, sought to overturn the existing government. That argument however had little weight, or rather it worked a contrary way; his influence continued to increase; and when, in the end of the year 1559, the congregation resolved on taking the government into their own hands, he was one of the council appointed for civil affairs. On the death of the queen regent he was made one of the lords of the articles; and on the dauphin's death he was directed by the convention of estates to proceed to France and invite Mary to return to her native country. Such an appointment suited the views of the prior well: for previous to the death of Francis the lord James had entered into a correspondence with the young queen, soliciting the renewal of his French pension, and in reply Mary had assured him not only of that, but of the highest favours, civil or ecclesiastical, which could be conferred upon him, provided he would return to his duty. He had also at the same moment applied through Throckmorton to Cecil, the English minister, requesting some pension or allowance in recompence for the losses he had sustained in the cause of the Reformation. He therefore willingly undertook the proposed mission, and setting out on the service accordingly, reached the palace and quickly gained admittance to the queen. He then found that an envoy from the Roman Catholic party in Scotland had preceded him; and in the interview which the prior had with his sister, he learnt that the disturbed state of the country and his own ambitious views had been strongly insisted on. Mary however adopted her brother's suggestions, and agreed to return to Scotland without that armed force which the Roman Catholic envoy had represented as wholly indispensable. The lord James immediately communicated the result of the conference to Throckmorton, the English ambassador, but in a secret manner; and, contrary to Mary's express wishes, in returning home he waited on Elizabeth, to strengthen, no doubt, the friendship which subsisted between her and the reformers in Scotland, and no doubt also to acquaint her with the determination which Mary had been induced to form. It is observable that the letters from Throckmorton at this period strongly urge upon Elizabeth to secure the lord James's regard; and from one of them it may even be inferred that Elizabeth had done him some 'good turn,' as Throckmorton expresses it, for this very end.

The lord James returned to Edinburgh in the beginning of June, 1561, having been absent on his mission about two months. In ten weeks after, Mary embarked from Calais, and after a voyage of five days arrived in the port of Leith. On her arrival she found the prior among the first men in the kingdom; and he then naturally became her prime minister, confidant, and adviser. In this situation he acted with great tact and judgment, and at the same time with much tenderness to the queen. He protected her in the exercise of her own religion, and in return obtained from her a proclamation highly favourable to the reformers: he restrained the turbulence of the borders, moderated the zeal of the people against popery, and at once kept down the enemies of Mary's dynasty and strengthened the attachment of her friends. Mary rewarded his services by conferring on him the title of Earl of Mar, and honoured his marriage with the lady Agnes Keith, eldest daughter of the earl marischal, which took place about the same time, with a series of splendid entertainments. The greatness of the banqueting indeed, and the vanity thereof, offended the more strict of the reformers, and Knox took occasion to read the lord James a solemn admonition; 'for (said the preacher) unto this day the kirk of God hath received comfort by you and by your labours, in the which if hereafter ye be found fainter than before, it will be said your wife hath changed your nature.'

The earldom of Mar, which the prior had just obtained from Mary, having been claimed by Lord Erskine as his peculiar right, was soon after resigned with the property belonging to it; but in its place the prior received the earldom of Murray, which had been long the favourite object of his ambition. This grant was scarcely a less matter of jealousy to the prior's great rival, the Roman Catholic earl of Huntly, than the grant of Mar was to the lord Erskine. But all dispute on that head was soon ended; for Huntly was shortly after proclaimed a traitor for various overt acts of insubordination and rebellion, originating in disappointed ambition; and not long after that he suddenly expired. Murray was now left in undisputed possession of the chief authority in the kingdom next to the queen, who reposed in him almost unlimited confidence. An incident occurred about this period which showed the influence he possessed in the government, and at the same time how he was thought occasionally to use it. His services in the cause of the Reformation were manifest and important, yet the lord James was not all that the reformers wished; his religious zeal was not hot enough; and they lamented the protection he afforded to the queen in her use of the mass. But they were not prepared to find him now extending his protection to her and her ladies in what Knox calls 'the superfluities of their clothes,' which he said would bring down the vengeance of God 'not only on the foolish women but on the whole realm.' Knox imputed Murray's conduct on this occasion to a selfish fear of offending the queen, lest she should repent of her munificence and refuse to confirm her grant of the new earldom; and denouncing such motives in strong terms, accused him of sacrificing truth to convenience, and the service of God to the interests of his ambition. Murray was so incensed at this attack, that for a year and a half Knox and he scarcely exchanged words together. The queen's marriage with Darnley seems to have been among the first things to bring them together again; as it was also the first step in the subsequent estrangement between Murray and the queen. To this marriage Murray, Knox, and Elizabeth, and their respective followers, were all opposed. Knox and the reformers were opposed to it

on religious grounds, and it was opposed by Murray and Elizabeth partly on the same grounds, but partly also on personal or political considerations. Murray was not accessory however to Darnley's murder: he knew of it indeed; but, as he said, he did not wish to meddle with the business, and would neither aid nor hinder it. Accordingly he left Edinburgh abruptly on the morning of Sunday, the 9th of February, 1567, the last day of Darnley's life, alleging his wife's illness at St. Andrew's as the cause of his departure; and we do not hear of him in Edinburgh again till about a fortnight after all was over, when he had Bothwell (the perpetrator of the horrid deed) and Huntly, Argyle and Lethington, all parties to it, at dinner at his house. Nor did Murray remain in Edinburgh so as to be present at Bothwell's trial, for in the beginning of April he asked leave to go away to the Continent, but on what grounds is not known; and on the 9th, which was just two days before the trial, he set off, visiting London and the court of Elizabeth on his way. He remained abroad till the end of July, returning only a few days after the coronation of the young prince James. He was therefore absent from the parliament which was held immediately after Bothwell's acquittal, and from the famous supper at Ainslie's, when the principal nobility signed the bond acquitting Bothwell of all concern in Darnley's murder, and engaging to support him in obtaining Mary's hand in marriage. And he was thus also absent during the important occurrences attendant on the queen's marriage with Bothwell. He was not ignorant of all that was going on: Cecil too was in constant communication with him; and soon after the queen's surrender of herself to 'the prince's lords' at Carberry Hill, he sent an accredited agent into Scotland to attend to his interests.

He was at length proposed as regent of the kingdom. Before agreeing however, he resolved to visit Mary in person; and accordingly repaired to Lochleven Castle, where she was now a prisoner. When Mary saw her brother, she burst into tears, and they had afterwards a private conference together, the particulars of which are not fully known, but it is said that Mary was frequently bathed in tears with his upbraidings.

On the 22nd of August, 1567, he was proclaimed regent; and with his usual vigour he immediately proceeded to establish himself in the government. He now held the situation even against the queen herself; for when, having made her escape from Lochleven, she called on him to resign the regency, he at once refused, and took the field against her at Langside, where she sustained a complete defeat. Nor did his determination end here; for being summoned by Elizabeth to bear testimony in the trial which had been instituted by that queen against Mary, he immediately repaired to the appointed place, and did not hesitate in bearing witness against the unhappy prisoner. His own fate however was settled before that of his sister. For while passing through the streets of Linlithgow, on the 23rd of January, 1570, he was shot through the body by a bullet fired from a window by James Hamilton of Bothwelhaugh, nephew to the archbishop of St. Andrew's, in revenge for some personal injury committed by the regent years before. Murray survived till midnight, when he died, in the thirty-eighth year of his age.

MURRAY, SIR ROBERT, son of Sir Robert Murray of Craigie, entered in early life into the French service, where, by the favour of Cardinal Richelieu, he soon obtained the rank of colonel. He returned to Scotland when the difficulties of King Charles I. were beginning to assume their most alarming aspect; and at Newcastle he had a design for the king's escape, which seems to have been frustrated only by Charles's want of resolution. 'The design,' says Burnet, 'proceeded so far that the king put himself in disguise and went down the back stairs with Sir Robert Murray; but his majesty, apprehending it was scarce possible to pass through all the guards without being discovered, and judging it highly indecent to be catched in such a condition, changed his resolution and went back, as Sir Robert informed the writer.' (*Mem. of Duke of Hamilton*, 307.)

On the fall of the royal cause he appears to have gone again to France; and on the 22nd of May, 1650, two letters from that kingdom were read to the parliament of Scotland, one from the young king, the other from the queen-regent, in answer to a letter from the parliament in favour of Sir Robert Murray, in both which they promised, 'from their respect and love to the Scots nation, that they would see their desire performed, so far as possibly the convenience of their affairs would permit, and that he should be paid off his arrears.' (4 *Balf. Ann.*, 17.)

He must have returned to Scotland soon after this; for on the 21st of May, 1651, while Charles was in command of the army there, Murray was appointed justice-clerk, an office which appears to have remained vacant since the deprivation of Sir John Hamilton, in the month of February, 1649. A few days after this appointment Sir Robert was sworn a privy-counsellor; and on the 6th of June, 1651, he was nominated a lord of session; but the court being suspended by Cromwell's proceedings, he never sat on the bench. At the Restoration his appointments as a lord of session and justice-clerk were renewed. He was then also made one of the lords-auditors of exchequer. In speaking of the second of these appointments, Mr. Laing falls into an error: he says, 'Sir Robert Murray, whom the Royal Society should revere as its father, was appointed justice-clerk, and the people were pleased and gratified when *a judicial office so important and dangerous* was conferred on the most upright and accomplished character which the nation produced.' (Laing, *Hist. of Scotland*, iv. 51.) At that time however the office of justice-clerk was not the important situation which it now is; nor was it for a dozen years after that the justice-clerk became vice-president of the justiciary court. He was however an assessor to the justiciar or justice-general; he was the first who had the style of lord-justice-clerk; and it is highly probable that his character and reputation paved the way for the advancement of his successors. It does not appear that Murray ever sat on the bench at all. He was made a judge of three courts at one time, not perhaps that he might be a judge in any, but that the emoluments might attach him as a partisan. He was not bred to the law, and does not appear ever to have been in circumstances to acquire a knowledge of it. In the above passage however Laing refers to an event in Sir Robert's life of great interest and importance: he was the father of the Royal Society. That body had existed as a debating club previous to the time of the Commonwealth, when its members were dispersed. At the Restoration the Society assembled again, and conducted their proceedings on a more extensive scale. On the 28th of November, 1660, we find Sir Robert present at what was probably the first meeting, when it was proposed 'that some course might be thought of to improve this meeting to a more regular way of debating things; and that, according to the manner in other countries, where there were voluntary associations of men into academies for the advancement of various parts of learning, they might do something answerable here for the promoting of experimental philosophy.' (1 Kirch., *Hist. Royal Soc.*, 3.)

It was Sir Robert Murray who undertook to communicate the views of the Society to the court, and at the next meeting he returned an answer indicative of encouragement from that quarter; and after rules for the government of the Society were established, Sir Robert was chosen first president. He was a member of almost all committees and councils, contributed several papers, and prepared and exhibited various experiments. The authors of the 'Historical Account of the Senators of the College of Justice' say he was re-appointed justice-clerk in 1667, and sent down to Scotland, which he continued to rule with a gentleness quite unknown to the counsels of his predecessors. But this is scarcely correct. Sir John Home of Renton, who was a great zealot in the cause of episcopacy, which Charles wished to introduce into Scotland, was appointed justice-clerk in 1663, in the room of Sir Robert Murray: and on his death, in 1671, he was succeeded by Sir James Lockhart of Lee.

Sir Robert Murray died suddenly, in the month of June, 1673. Burnet says, 'He was the most universally beloved and esteemed, by men of all sides and sorts, of any man I have ever known in my whole life. He was a pious man, and in the midst of armies and courts spent many hours a day in devotion, which was in a most elevating strain. He had gone through the easy part of mathematics, and knew the history of nature beyond any man I ever yet knew. He was the first former of the Royal Society, and its first president; and while he lived he was the life and soul of that body. He had an equality of temper in him which nothing could alter, and was in practice the only Stoic I ever knew. He had a most diffused love to all mankind, and delighted

in every occasion of doing good, which he managed with great discretion and zeal. He had a superiority of genius and comprehension to most men, and had the plainest but withal the softest way of reproving people for their faults that I ever knew of.' (1 *Burnet's Own Times*, 59.)

MURRAY, PATRICK, fifth LORD ELIBANK, eldest son of Alexander, fourth lord, was born in February, 1703; and on the 22nd June, 1723, he passed advocate. (*Fac. Reg.*) He did not prosecute the legal profession however; perhaps he never meant to do so, but only, in accordance with a feeling in behalf of 'learning,' which prevailed and still prevails in Scotland, he acquired the name and status of a Scottish advocate. The same year he entered the army; and in 1740, which was about five years after he had succeeded by his father's death to the family honours, we find his lordship a lieutenant-colonel in the expedition to Carthagena, of which expedition he wrote an account, which remains in manuscript, it seems, in the library of the Board of Trade. From that time he frequently committed his thoughts to paper, and was known among the literati of Edinburgh, his contemporaries, for the acuteness of his understanding and the varied nature of his information. In 1758 he published 'Thoughts on Money, Circulation, and Paper Currency;' and soon afterwards an 'Inquiry into the Origin and Consequence of the Public Debts.' In 1765 he published 'Queries relating to the proposed Plan for altering Entails in Scotland;' and in 1773, a 'Letter to Lord Hailes on his Remarks on the History of Scotland.' The same year, when Dr. Johnson visited Scotland, he addressed a letter to him, and had afterwards various interviews with him. In 1774 he published some 'Considerations on the present State of the Peerage of Scotland.' In political life he was an opposition lord; and is now known to have maintained a correspondence with the exiled house of Stuart. His younger brother Alexander Murray was likewise so enthusiastic a Jacobite as to propose leading an insurrection in favour of the Pretender. That brother, it may also be mentioned, was in 1750 confined, by order of the House of Commons, for violent interference with a Westminster election; and as he refused to express contrition on his knees according to the order of the house, he was detained in confinement upwards of a twelvemonth, and might have been confined longer had not a prorogation of parliament at that time occasioned his release. The fourth and youngest brother of Lord Elibank likewise attracted considerable notice, distinguishing himself greatly as an officer in high command during the Canadian war. Lord Elibank died without issue, 3rd August, 1778, in the seventy-sixth year of his age.

MURRAY, Dr. ALEXANDER, was born at Dunkitterick, in the stewartry of Kirkcudbright, on the 22nd October, 1775. He was the eldest child of his father's second marriage. His father Robert Murray had by his former marriage, which had subsisted full forty years, a numerous family; and in the course of about four years after his wife's death, himself now entering his 70th year, he married again, and had two children more. Robert was a healthy and vigorous shepherd or pastoral farm servant in one of the mountain districts of Galloway, and distinguished for his sagacity and habitual good conduct: his whole property consisted of four muirland-cows and some two or three scores of sheep, his reward for herding the farm of Kitterick for Mr. Laidlaw in Clatteringshaws. He had been a shepherd all his days, like his father before him, and both had constantly remained in the same neighbourhood. His wife was the daughter of a neighbouring shepherd: all the sons of his first marriage became shepherds; and to the same line of life he designed Alexander.

Alexander however was, in his father's opinion, a lazy useless boy, always committing some blunder or other when sent to herd or bring in the cattle. He was in fact a weakly child, not unhealthy, yet not stout; and he had neither the rapidity nor reach of vision which are indispensable to form a good *herd:* he was also of a sedentary and recluse turn; and thus quite unfitted for the vacant, indeed, but vigilant life of a shepherd. To the old man therefore, whose world was the dark and lonely glen where his cottage lay, and the adjoining hills which he sometimes ranged, young Murray must have been an object of no great concern. Accordingly it was not till he had reached his sixth year that he was taught the alphabet of his mother-tongue. The old man in that year laid out a halfpenny in the purchase of a catechism, and from the letters and syllables on the face of the book he began to teach his son the elements of learning. It was however emphatically *a good book*, and only to be handled on Sundays or other suitable occasions; it was therefore commonly locked up, and, throughout the winter, the old man, who had been himself taught reading and writing in his youth, drew for his son the figures of the letters in his *written* hand on the board of an old *wool-card* with the black end of a burned heather-stem. In this way young Murray was initiated into literature; and working continually with his board and brand, he soon became both a reader and writer. The catechism was at length presented, and in a month or so he could read the easier parts of it. In the the summer of 1782 he got a Psalm-book, then a New Testament, and at last a Bible, a book which he had heard read every night at family worship, which he often longed to get hold of, but which he was never allowed to open or even touch. He now read constantly, and having a good memory, he remembered well and would repeat numerous psalms and large portions of scripture. In 1783 his reading and memory were become the wonder of the rustic circle in which he lived; and a wish began to be generally entertained that he should be sent to school. The idea of school-wages however frightened his father; and in all likelihood nothing would have been done, had not William Cochrane, a brother of his mother's, paid a visit to the place in the harvest of the above year. He had made a little money as a travelling merchant, and being informed of the *genius*, as it was called, of his young nephew, he generously undertook to place him next spring at the New Galloway school, which was about six miles off, and to lodge him in the house of the boy's grandfather by the mother's side, who lived about a mile from New Galloway. Accordingly at the Whit-Sunday term of 1784, young Murray, then in his ninth year, was brought to the New Galloway school; where, for a month at least, his pronunciation and awkward gait were a source of perpetual merriment to the scholars. They soon began however to regard him with other feelings. Being utterly neglected by his aged grandfather, he learned to curse and swear, to lie and do all sorts of bad tricks; but before the vacation in August he was also repeatedly *dux* of the Bible class. He continued at school for about a fortnight after the vacation had ended; but in the beginning of November he was seized with an illness which obliged him to be taken home. Here, so soon as his health got a little better, he was put to his old employment of a *herd*, with the rest of the family; and this course of life now continued for about three years. During all that time he spent every penny which he procured from friends or strangers in the purchase of books and ballads, carried bundles of these in his pockets, and read them in the glen or on the hills when tending the cattle, and was ever puzzling and surprising his illiterate neighbours with recitals of what he had learned. In 1787 he borrowed from a countryman Salmon's 'Geographical Grammar,' which delighted him beyond measure, particularly by the specimens it contained of the various languages of the world. In the winter of that year, being able to read and write, he was engaged by the heads of two families in a neighbouring parish to teach their children. He returned home in March, 1788, and with part of his fees, which were 15*s.* or 16*s.*, he bought books of history and arithmetic. The following year his father and the family left Kitterick, and went by engagement to herd at a place four miles above Minnigaff, the school of which place Murray immediately resolved to attend. He entered himself accordingly, and during the summer months walked three days every week to Minnigaff school. Here he read incessantly, not only his own books, but, by coming an hour before the school met, the books of all the other scholars which were left in the school. At Martinmas, 1789, he was engaged by three families in the moors of Kells and Minnigaff to teach their children; and during that winter he migrated about, remaining six weeks in one family at a time, the families living at considerable distances from each other. He returned home a little before Whit-Sunday, 1790, and found that from that term his father was engaged as a shepherd on a farm within two miles of Minnigaff. To this farm the family accordingly removed, and Murray, having now easy access to the school, went thither regularly, and also determined on adding to his former acquisitions a little French, which he found was necessary for a clerk intending to go to America or the West Indies, a situation he had some thoughts of obtaining. He immediately borrowed a French grammar, and set to learning the language so hard

that in less than a fortnight, his indulgent master giving him whole pages of lessons at a time, he could read portions of the 'Diable Boiteux.' He then found one of the boys in possession of a Latin Rudiments: he borrowed it too, and by incessant reading and a little help from the master, before the vacation in August he beat a class of scholars who had been a considerable time at the study. At Martinmas, he went to teach in a family reading, writing, arithmetic, and Latin.

In this situation he applied to his books with his usual zeal; and having, among other works, bought an old and bulky edition of Ainsworth's 'Dictionary,' for eighteenpence, he literally read it through from A to Z, and again from Z to A. On Whit-Sunday, 1791, he returned to school, and finding a schoolfellow in possession of a Greek grammar, he commenced that language, after spending part of his winter's wages in the purchase of a grammar and lexicon. He had also by this time mastered the Hebrew alphabet, at first from an old Psalm-book, where the letters were marked in succession in the 119th psalm; and afterwards, together with some Hebrew vocables, from his Ainsworth. He now determined on learning that language also, and, accordingly, sent to Edinburgh for a grammar by the man who rode with the post: the man brought him the first edition of Robertson's 'Grammar,' which, over and above the Hebrew, contained on the last leaf the Arabic alphabet, to which, without delay, Murray next applied. At Martinmas of the above year he was again engaged to teach, but at the increased fee of 35*s.* or 40*s.*, and in this situation he devoted every spare moment to French, Latin, Greek, and Hebrew. In summer he was again at school, and again, in the winter, teaching in a family; but on this occasion at a somewhat lower allowance than before, Murray having chosen the place from its convenience to a school which he wished to attend in the winter evenings. In this school he got hold of Bailey's 'English Dictionary,' which introduced him to the Anglo-Saxon language. He proceeded in this way, taking advantage of every circumstance to increase his knowledge of languages; and at length, in November, 1794, he came to Edinburgh, under the countenance and protection of the Rev. Dr. Baird of that city. Murray was at this time in the nineteenth year of his age. His subsequent progress was comparatively easy. In the course of two years he obtained a bursary or exhibition to the university of Edinburgh; and never relaxing in his pursuit of knowledge, he soon made himself acquainted with all the European languages, and began to form the design of tracing up all the languages of mankind to one source. His acquirements as a linguist naturally pointed him out to Constable, the well-known publisher, as a fit person to superintend a new edition of Bruce's 'Travels;' and in the preparation of that work he was employed for about three years, from September, 1802, Murray residing during that time chiefly at Kinnaird-house, where he had access to the papers left by the traveller. He was also at different times employed in contributing to the 'Edinburgh Review' and other periodicals. By the advice of his friends, he prosecuted the studies necessary for the Church, to which his attention was directed as a permanent source of employment; and at length, in Dec., 1806, he was appointed assistant and successor to Dr. Muirhead, minister of Urr, in the stewartry of Kirkcudbright, a charge to which he in 1808 succeeded as full stipendiary. Within six months after, he married the daughter of a farmer in the neighbourhood. He still continued his philological pursuits. In 1811 an incident occurred which brought him into prominent notice as a linguist: on the recommendation of Mr. Salt, envoy to Abyssinia, he was applied to by the Marquis Wellesley, as the only person in the British dominions qualified to translate a letter written in Geez, from the governor of Tigrè to his Britannic Majesty; and he performed the task in the most satisfactory way. The following year a vacancy occurred in the chair of Oriental languages in the university of Edinburgh, of which the town-council of the city are the patrons. The income from this chair was small; the gross emoluments of the present professor, who was a competitor with Murray, and afterwards his successor, are considerably short of 300*l.* per annum. It was however perfectly suited to Murray's taste and habits: it brought him to Edinburgh, where his literary labours could be both assisted and valued; and there was a great probability that some other situation would soon, as at present, be conjoined with it. Great exertions were accordingly made to secure his election; and notwithstanding some fears of his health giving way under it, his appointment took place. (*Scots Mag.*, July, 1812.) He was elected on the 8th July, 1812, and on the 15th the university conferred on him the degree of Doctor in Divinity. On the 26th of August he was formally inducted to the chair, and he began to lecture on the 31st October following. Soon after that he published, for the use of his students, a small work entitled 'Outlines of Oriental Philology,' which is known to have been both composed and prepared for publication after his arrival in Edinburgh; the subject indeed was perfectly familiar to him. He continued to teach his class with little interruption till the end of February or the beginning of March; and at such times as his health would not permit him to attend his public lecture, he taught a small Persian class in his own room. The pulmonary complaint however, with which he had been struggling through the winter, at length compelled him to suspend his prelections; yet, with its characteristic deceit, it always flattered him with hopes of resuming them; and, quite unconscious of his real situation, he continued engaged in his favourite studies till within a few days of his death, which took place on the 15th April, 1813, in the thirty-seventh year of his age. His body was interred in the Grey Friars' Churchyard, at the north-west corner of the church.

This great linguist was an eminent example of the pursuit of knowledge under difficulties. His life however may be described rather as the preparation for some result than as having accomplished much; and the performance by which he will be known in the literary world, though distinguished by profound and various learning, was both imperfect and posthumous. It appeared under the auspices of the Rev. Dr. Scot of Corstorphine, and is entitled a 'History of the European Languages, or Researches into the Affinities of the Teutonic, Greek, Celtic, Sclavonic, and Indian Nations.' An extensive acquaintance with these languages convinced the author that all the European languages were closely connected; and in the work now named, it is his object to show that they all derive from, and may be traced to, nine euphonic primitives, which primitives he states to be *ag*, *bag*, *dwag*, *gwag*, *lag*, *mag*, *nag*, *rag*, and *swag*. 'By the help of these nine words and their compounds,' says he, 'all the European languages have been formed.'

MURRHINE (sometimes written *Myrrhine*) VASES, vessels used by the antients, were made of the stone or hard substance, whatever it might be, termed *murrha* (*μύῤῥα*). They are frequently noticed by the classic writers, and usually described as transparent, though sometimes spotted or clouded, like our cups of agate. Pliny speaks of them as coming from the East, from Parthia and Carmania. He adds that they were first brought to Rome by Pompey after his victory over Mithridates. 'The same victory,' he observes, 'introduced Murrhine vessels into the city, and Pompey was the first who dedicated to Jupiter of the Capitol precious stones and cups, after his triumph on that occasion. They afterwards came into common use.' (Plin., *Hist. Nat.*, li. xxxvii., edit. Harduin, vol. ii., p. 767.) The abbé Le Blond, in the 43rd volume of the 'Mémoires de l'Acad. des Inscriptions,' supposes that these vessels were made of the oriental sardonyx. Others have supposed the material to have been a kind of Chinese stone. The best alabaster in antient times was furnished from the quarries of Carmania, which may possibly have supplied the materials for the murrhine vessels.

MURVIEDRO. [SAGUNTUM.]

MUS. [MURIDÆ.]

MU'SA, IBN NOSSEYR, Governor of Mauritania. The origin and genealogy of this conqueror are differently stated by the Arabian writers. Some make him the son of Nosseyr, son of Abd-el-rahman, son of Zeyd, of the tribe of Bekr; others assert that he belonged to the illustrious tribe of Lakhm; while there are not wanting genealogists who deny his ever having had any connexion with either of the above-mentioned tribes, and suppose him to be the son of a liberated slave of Muawiyah Ibn Abí Sufyán, the first khalif of the race of Umeyyah in the East. All however agree that his father Nosseyr was a *mauli*, or adherent of Muawiyah, that he served under his banners against Ali, and, as a reward for his services, was raised to the post of commander of the khalif's body-guard.

According to all accounts, Músa's birth is placed in the

year 19 of the Flight (A.D. 640). He seems to have made his first campaigns under his father, and to have been present at almost all the battles then fought by the Moslems. His bravery and the military talents which he displayed on several occasions made him a favourite with 'Abd-el-'aziz Ibn Merwan, a prince of the royal family then governor of Egypt, who attached him to his person, raised him in command, and, having previously obtained leave from his brother the khalif, appointed him general of the armies destined to achieve the conquest of Africa, in the year 79 of the Flight (A.D. 698-9). What the first expeditions of Músa were, is not satisfactorily ascertained. The Arabian writers say, in vague terms, that he pushed his conquests far into the West, and penetrated into the interior of Africa, returning with a rich spoil and thousands of captives. But he seems to have achieved nothing brilliant until the year 88 (A.D. 707), when the khalif Al-walid named him governor of Mauritania, with instructions to complete the conquest of the country.

Músa took his departure from Egypt at the head of a numerous army, and, partly by persuasion, partly by force, succeeded in reducing to obedience the motley tribes that inhabited the northern shores of Africa. He seems to have experienced no difficulty in uniting under his standard men whose habits were not dissimilar from those of the Arabs, and who, relying on antient traditions current among them, believed themselves to be sprung from the same stock as their invaders. [BERBERS.] Under such a belief, which Músa dexterously tried to strengthen, whole tribes flocked to his banners, embraced the religion of the Prophet, and, led by his lieutenants, marched to new conquests. Tangiers, Arsilla, and Ceuta, three insulated fortresses which still held out for the Goths, were speedily reduced; a fleet commanded by Abdullah, Músa's eldest son, scoured the Mediterranean, and ravaged the islands of Sicily, Sardinia, and Mallorca; and in the year 91 of the Flight (A.D. 709) the whole of northern Africa, from the Pillars of Hercules to the delta of Egypt, acknowledged the laws of the conqueror.

At this critical moment, when the restless ambition of the African governor had been stimulated by so much success, a favourable occasion presented itself to satisfy his appetite for conquest. Gothic Spain was a prey to the most horrible anarchy. After the death of King Wittiza, Roderic, the son of a provincial governor, had usurped the throne to the prejudice of Eba and Sisebuto, the two sons of that monarch, who had taken up arms in support of their rights. Unable however to keep the field against Roderic, the sons of Wittiza and the noblemen who followed their party (among whom was a certain Julian or Ilyán) despatched a messenger to Músa, inviting him to invade Spain, and promising to aid him in his enterprise.

No sooner was Músa made acquainted with the divisions among the Goths, than he eagerly seized on the opportunity of interfering in them. By his orders Tarif Ibn Málik, one of his servants, made a slight incursion in the month of Ramadhán, A.H. 91 (July, A.D. 710), and returned to Africa loaded with spoil. A second expedition, commanded by Tárik Ibn Zeyád, landed on the coast of Spain, in April, 711, and two months afterwards [MOORS] Roderick was defeated and killed in the battle of Guadalete.

On the news of this signal victory reaching Africa, Músa, who was far from expecting so complete success, felt a desire to share in the laurels reaped by his lieutenant; and while he hastily made the necessary preparations to cross over into Spain, he sent orders to Tárik not to move from his position, and to wait for further instructions. But the Arabian general had gone too far to be stopped by a mere message from his master. Eager for plunder, and bent on the subjugation of the whole country, he penetrated into the heart of Spain, and, before his master Músa had set his foot on the peninsula, the opulent city of Toledo, the capital of the Gothic monarchy, together with an immense booty, had fallen into his hands.

At this period Músa arrived in Spain, breathing vengeance against the man who, by disobeying his commands, had deprived him of so rich a harvest of glory and wealth. He landed at Algesiras, in June, A.D. 712, at the head of 18,000 men. He took with him three of his sons, Abdulaziz, Merwán, and Abdulola, leaving his eldest son Abdullah to govern Africa in his stead. His first step was to subdue such provinces as, by Tárik's precipitate march upon Toledo, had remained untouched. He laid siege to Seville, which he reduced in a month (July, 712). Carmona and other neighbouring cities shared the same fate. Thence he passed into Lusitania, and, almost without halting in his rapid march, seized on Niebla, Beja, and other considerable cities (August, 712). His victorious career was stopped for a time before the walls of Merida, which he reduced, after an obstinate defence on the part of the garrison, towards the end of November, 712. From Merida Músa marched to Toledo, where, having had an interview with Tárik, he publicly reproached him with his disobedience, caused him to be beaten with rods, confiscated his property, and had him cast into a dungeon, where he remained until orders came from the khalif to release him, and give him, as before, the command of one of the divisions of the army.

The remainder of Spain was speedily subdued. Tárik, at the head of his troops, marched eastwards, and, after reducing the intermediate provinces, laid siege to Saragossa. Músa took a northern direction, reduced Salamanca, advanced as far as Astorga, and thence, returning to the Douro, followed the course of that river to Seria, passed the mountains, and arrived in sight of Saragossa, which Tárik was then investing, and which surrendered in July, 713.

From thence Tárik proceeded to Valencia, which, together with Murviedro, Xativa, and other considerable cities of those districts, were reduced with amazing rapidity; while Músa himself, after detaching some forces under the command of his son Abdulaziz to subdue and plunder the plains of Murcia, marched towards the Pyrenees, reduced on his passage the cities of Calahorra, Lerida, Barcelona, and, crossing that mountain barrier, penetrated into France.

How far Músa advanced into that country is not satisfactorily ascertained. According to Al-makkari, an Arabian writer, who compiled a history of Spain from the best sources (*Arab. MSS.*, in the Brit. Mus., 7334), Músa subdued not only Narbonne, but the greatest part of the province known by the name of Gallia Gothica; but, as other Arabian historians are silent on the subject, and as the Christian chroniclers of France have not made the slightest mention of this invasion, we are authorised in thinking that, if Músa did really cross the Pyrenees, his invasion was unattended with any important results. On his return from this expedition to the Pyrenees, a messenger from the khalif Al-walid, who now became alarmed at Músa's increase of power, reached his camp, and summoned him, together with Tárik, to the royal presence.

Tárik hastened to obey the orders of the khalif, and departed immediately for the East (Sept., 713); but Músa, who, if any faith can be placed in the Arabian writers, had conceived the ambitious project of subduing Gaul, Italy, and Germany—and forcing his way from Spain to Constantinople, thus connecting the eastern and western possessions of the Arabs—refused to comply with the summons. Having prevailed upon the envoy Mugheyth to accompany him in his conquests, by promising him a large share of the spoil, he directed his course towards Asturias and Gallicia, which the Moslems had not yet visited. But his reluctance to obey the imperial mandate added to the suspicions already entertained about his views, which were represented as aiming at independence, and a more peremptory order was sent for his return. The khalif's second messenger, whose name was Abú Nasr, reached him at Lugo, in Gallicia, caught the bridle of his horse, and, in presence of the army, commanded him to repair to Damascus. Músa did not venture to disobey the order of the khalif, and, entrusting the government of Spain to his son Abdulaziz, reluctantly commenced his journey, in March, 714.

On arriving in Africa, where he made some stay, he confirmed his son Abdullah in his government of Cairwán, gave to his son Abdulola the command of Tangier and other important fortresses on the coast, and taking the road to Egypt, proceeded to Syria with a numerous escort, and long trains of camels heavily laden with the spoil of the conquest, besides being followed by thousands of captives, among whom were 400 Gothic nobles, sumptuously arrayed.

Músa did not reach Syria until the end of 714 or the beginning of 715. Tárik had arrived many months before, and not only had justified himself against the charges brought against him, but had succeeded in throwing all the blame upon Músa. To this must be added that Al-walid was then suffering under an acute disease, which soon

after caused his death, so that Músa's reception was not so brilliant as he had anticipated. But if Al-walíd's treatment of the man who had added so rich a jewel to his crown was tainted with deep ingratitude, that of his brother and successor Suleymán was not only unjust but cruel. It is generally asserted that while Músa and his escort were approaching the capital, he received from that prince an intimation not to enter Damascus in his brother's lifetime, but to delay his entrance until the commencement of the new reign, in order that the Spanish treasures and captives might grace his accession. This command, Músa, from motives of fidelity towards his sovereign, imprudently disregarded; and on the accession of Suleymán, remained exposed to all his vengeance. He was cast into prison, beaten with rods, exposed to the sun until he was nearly dead, and lastly, fined two hundred thousand pieces of gold, a sum which all his treasures amassed in Spain were insufficient to satisfy, and which was raised among his friends. Suleymán's vengeance did not stop there; the two sons whom Músa had left to govern Africa in his absence were deprived of their governments, and orders were despatched to Spain (Aug., 716) to put to death Abdulaziz, whose head was brought to Damascus and shown to his disconsolate father by Suleymán himself, who asked him, with a bitter smile, if he recognised it. The afflicted father turned away at the sight, exclaiming, 'Cursed be he who has slain a better man than himself.'

Músa died in the greatest poverty at Wádi-l-korá, in the Hejáz, in 717, at the age of seventy-nine lunar or Arabian years.

(Conde, *Hist. de la Dom.*, Mad., 1820-21; Cardonne, *Histoire de l'Afrique*, Paris, 1765; *The History of the Mohammedan Empire in Spain*, London, 1816; Casiri, *Bibl. Arab. Hisp. Esc.*, Madrid, 1760; Ibn Khallekán's *Wafiyatu-l-a'yán* (or the Lives of Illustrious Moslems), MS.; Al-makkari, and other historians of Mohammedan Spain.)

MUSA, ABU ABDALLAH MOHAMMED BEN, of Khowarezm, the earliest Arabic writer on algebra, whose treatise on that science, 'Al Jebr e al Mokābalah' (restoration and reduction), was composed for popular use at the command of the caliph Al Mamun. It contains rules and illustrations (rather than demonstrations) for the solution of simple and quadratic equations, with their application to various questions, mostly of a mercantile character. From internal evidence it appears to be drawn from Hindu writings, with which the author is known to have been acquainted; and the works of Diophantus were not translated into Arabic till after the time of Mohammed Ben Musa.

This work was (partially at least) translated into Latin at an early period; and M. Libri (*Hist. des Sci. Math. en Italie*, vol. i., note 12) has printed all the part of Ben Musa's treatise which the Latin manuscripts in the Bibliothèque du Roi at Paris contain. The complete work, in Arabic, with an English translation and notes by the late Dr. Rosen, was published by the Oriental Translation Society, in 1831, from a manuscript in the Bodleian Library.

It is from this work that (so far as Europe is concerned) algebra derives both its name and introduction; and the writings of Leonard Bonacci, Lucas di Burgo, and the earlier Italians, bear strong marks not only of their Arabic masters, but even of the particular work before us. Accordingly Mohammed Ben Musa was frequently called the inventor of Algebra, a title to which he has no claim.

In our account of the Viga Ganita a comparison is made of the Arabic algebra, as far as it goes, with that of the Hindus.

MUSA, ANTONIUS, was a physician of some celebrity at Rome. He was at one time the medical attendant of the emperor Augustus, whose slave he had formerly been; and he gained considerable reputation by the benefit which the emperor obtained, when, having been long under the care of Æmilius for arthritic pains, which had been unsuccessfully treated with warm applications, Musa ordered him cold affusions, and some other means equally contrary to his previous prescriptions. He prescribed a similar remedy also for Horace (*Epist.*, i. 15).

MUSA, a name given to a genus of plants having eatable fruit in tropical countries. They consist of herbaceous plants, having a gigantic simple stem, thickly clothed with the sheathing petioles of long, broad, horizontal leaves, which form a tuft, like that of some palm, on the apex of the stem." These leaves are of a firm but thin texture, and are undivided; but having simple veins running directly from the margin towards the midrib, and presenting a broad surface to the wind, they are always torn into broad strap-like divisions, which give them a compound appearance. From the midst of these leaves proceeds the inflorescence, consisting of a compound spike of great size, each of whose divisions is enclosed in a large bract or spathe, loaded with male flowers at its base, but bearing females or hermaphrodites at the upper end. The perianth consists of six superior divisions, five of which are grown together into a tube, slit at the back, while the sixth is small and concave. There are six stamens, one or more of which are imperfect. The ovary is inferior, 3-celled, with a double row of numerous ovules in each cell; the style is short; the stigma is funnel-shaped, and obscurely 6-lobed. The fruit is an oblong fleshy body, obscurely 3-5-cornered, containing numerous seeds buried in pulp. The latter are roundish, the size of a pea, flattened, with a hard brittle shell, which is indented at the hilum.

This genus is one of the most important of those found in tropical countries, to which the species are confined in a wild state. The *M. Sapientum*, or *Plantain*, of which the *Banana*, or *M. Paradisiaca*, is a slight variety, has a fruit used to a prodigious extent by the inhabitants of the torrid zone; and, from its nutritious qualities and general use, it



Musa Sapientum.

may, whether used in a raw or dressed form, be regarded rather as a necessary article of food than as an occasional luxury. In equinoctial Asia and America, in tropical Africa, in the islands of the Atlantic and Pacific oceans, wherever the mean heat of the year exceeds 24 centigrade degrees (75° Fahrenheit), the plantain is one of the most interesting objects of cultivation for the subsistence of man. Three dozen fruits will maintain a person, instead of bread, for a week, and appears better suited to him in warm countries than that kind of food. Indeed the plantain is often the whole support of an Indian family. The fruit is produced from among the immense leaves in bunches,

weighing 30, 60, and 80 lbs., of various colours, and of great diversity of form. It usually is long and narrow, of a pale-yellow or dark-red colour, with a yellow farinaceous flesh. But in form it varies to oblong and nearly spherical; and in colour it offers all the shades and variations of tints that the combination of yellow and red, in different proportions, can produce. Some sorts are said always to be of a bright green colour. In general, the character of the fruit to an European palate is that of mild insipidity; some sorts are even so coarse as not to be edible without preparation. The greater number however are used in their raw state, and some varieties acquire by cultivation a very exquisite flavour, even surpassing the finest pear. In the better sorts the flesh has the colour of the finest yellow butter, is of a delicate taste, and melts in the mouth like marmalade. To point out all the kinds that are cultivated in the East Indies alone would be as difficult as to describe the varieties of apples and pears in Europe, for the names vary according to the form, size, taste, and colour of the fruits: sixteen principal kinds are described at length by Rumphius from which all the others seem to have diverged. Of these the worst are, *Pisang Swangi*, *P. Tando*, and *P. Gabba-Gabba*; and the best are the round, soft, yellowish sorts, called *P. Medji* and *P. Radja*. Some cultivators at Batavia boast of having eighty sorts. Rheede distinguishes fourteen varieties by name, as natives of Malabar. In Sumatra alone twenty varieties are cultivated, among which the *Pisang Amas*, or small yellow plantain, is esteemed the most delicate, and next to that the *P. Raja*, *P Dingen*, and *P. Kallé*. In the West Indies, plantains appear to be even more extensively employed than in the Eastern world. The modes of eating them are various. The best sorts are served up raw at table, as in the East Indies, and have been compared for flavour to an excellent reinette apple after its sweetness has been condensed by keeping through the winter. Sometimes they are baked in their skins, and then they taste like the best stewed pears of Europe. They are also the principal ingredient in a variety of dishes, particularly in one called mantégue, which is made of slices of them fried in butter and powdered over with fine sugar. Of the many cultivated sorts, that called by the French *La Banane musquée* is considered the best; it is less than the others, but has a more delicate flavour. There are uncoloured figures of the plantain fruit in Rheede's 'Hortus Malabaricus,' vol. i., plates 12, 13, and 14; and coloured ones in Tussac's 'Flore des Antilles,' plates 1 and 2. All hot climates seem equally congenial to the growth of this plant: in Cuba it is even cultivated in situations where the thermometer descends to seven centesimal degrees (45° Fahrenheit), and sometimes nearly to the freezing point. There is a hardy variety called *Camburi* which is grown with success at Malaga.

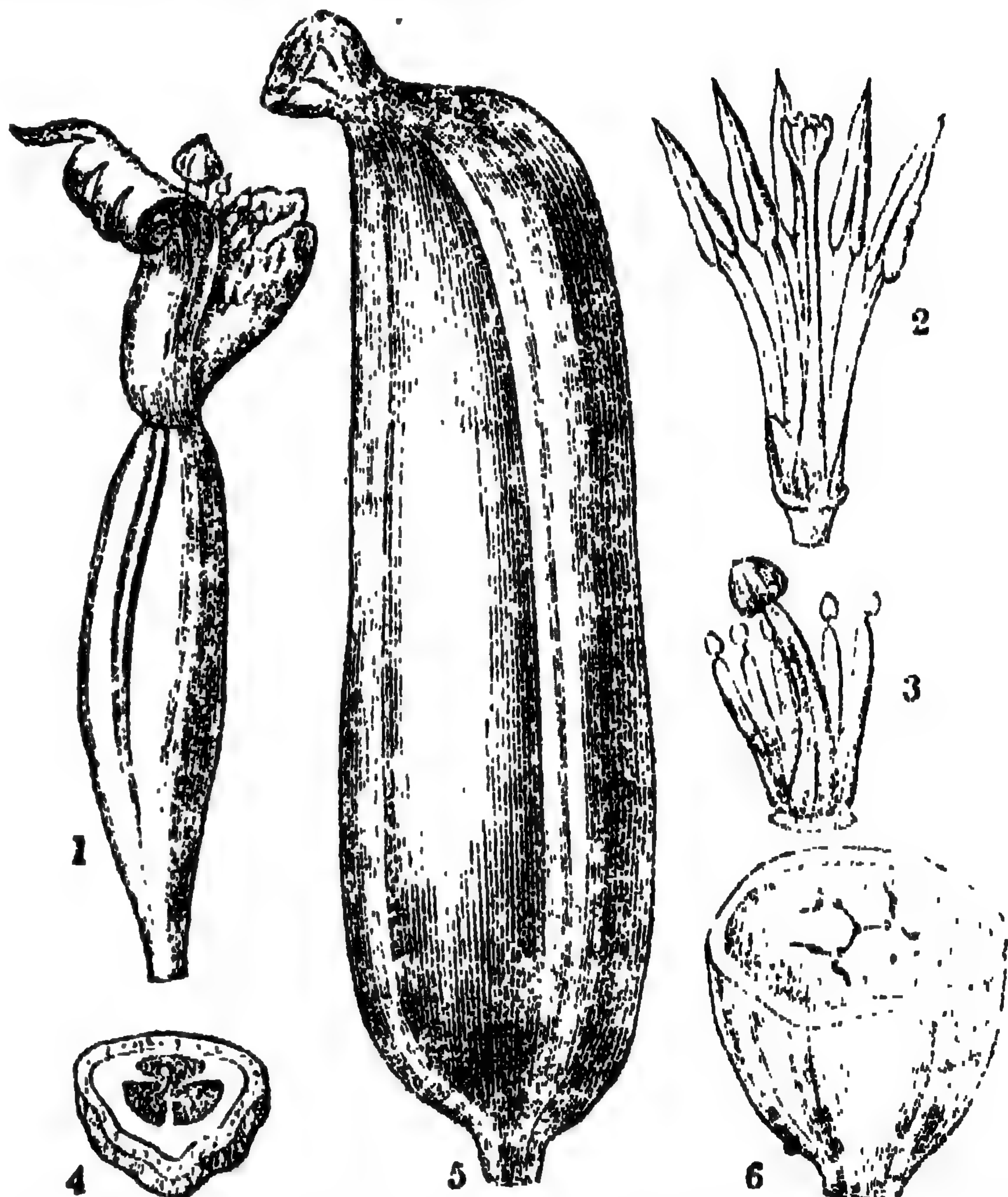
The plantain prefers a rich fat soil; for in sandy places, where it flowers abundantly, it produces no fruit.

In the climates that suit it, there is no plant more extensively useful, independently of its being an indispensable article of food. A tough fibre, capable of being made into thread of great fineness, is obtained from its stem; and the leaves, from their breadth and hardness, form an excellent material for the thatch of cottages. An intoxicating liquor is also made from the fruits when fermented, and the young shoots are eaten as a delicate vegetable.

The banana of hot countries is a mere variety of the plantain, distinguished by being dwarf, with a spotted stem and a more delicate fruit. Botanists call it *Musa paradisiaca*, in allusion to an old notion that it was the forbidden fruit of Scripture: it has also been supposed to be what was intended by the grapes, one bunch of which was borne upon a pole between two men, that the spies of Moses brought out of the Promised Land. The only argument of any importance in support of the latter opinion is, that there is no other fruit to which the weight of the fruit of Scripture will apply.

All the genus is Asiatic; the wild plantain is found in the forests of Chittagong, where it blossoms during the rains; *Musa coccinea*, a dwarf sort, with a stem not more than three or four feet high, is found in China; *M. ornata* and *superba* inhabit the forests of Bengal; *M. glauca* is from Pegu; *M. textilis* is from the Philippines, where it furnishes the valuable thread called *Manilla hemp*. There is also in the gardens of England a plant called *M. Cavendishii*, not above three feet high, and fruiting abundantly at that size, the origin of which is said to be the Isle of France.

MUSA'CEÆ are a natural order of Endogens, of which the last genus is the representative. They are generally stately and always beautiful herbaceous plants with the aspect of a plantain, and with large bracts or spathes, which are usually coloured of some gay tint. The characteristic marks of the order are to have an inferior ovary, with very irregular and unsymmetrical flowers, whose sexual apparatus is not consolidated. It is chiefly by these distinctions that it is known from Amaryllidaceæ. In some the fruit is fleshy, as in the plantain; in others it is dry and capsular. Only four genera are known of this order; all consisting of species of striking beauty. The *Heliconias* are the principal American form, nearly all the others being found in the Old World; of these the species are conspicuous for their brilliantly coloured rigid boat-shaped bracts, sometimes yellow, sometimes scarlet, and even a mixture of both. The *Strelitzias* are Cape plants with rigid glaucous leaves, and singularly irregular flowers of considerable size, coloured yellow and blue, or pure white. Finally, the *Ravenala* of Madagascar, *Urania speciosa*, a noble palm-like plant, is remarkable for the brilliant blue colour of the lacerated pulpy aril which envelopes the seeds; the latter are used for dyeing in Madagascar, but none of the order are of any important use to man, with the exception of the Musas themselves.



1, a flower, with its inferior ovary; 2, the sexual apparatus of a male flower; 3, ditto of a female flower; 4, a section of an ovary; 5, a ripe fruit, 6, the same cut through transversely.

MUSÆ'US. Two, if not more, Greek poets of this name are known. 1. The oldest of them lived in the mythic ages of Greece, and is said to have been by birth an Athenian, and the son, or at least the disciple, of Orpheus. Plato and Hermesionax, in a passage quoted by Athenæus (xiii. 597), state him to have been the son of Selene, or the moon. Diogenes Laërtius says that he was buried at Phalerum, and mentions his epitaph. His works, which are lost, have been quoted by Plato, Philostratus, Pausanias, Clemens Alexandrinus, and other antient writers: they consisted of religious hymns, a poem on the war of the giants, a theogony, a work on mysteries, and moral precepts to his son. A few scattered lines, gathered from the quotations of the above writers, were inserted by Henri Etienne in his collection of philosophical poetry. 2. Musæus, styled the Grammarian in the MSS., is the author of the very interesting Greek poem entitled 'Hero and Leander.' The age in which the author lived has been a subject of much dispute. Scaliger, against all probability, ascribed the poem to the Musæus of the mythic ages. The most general opinion is, that he lived in the lower ages of the Roman empire. Schrader, Schoell, and other critics suppose him to have lived in the fifth century of our æra, and to have been a contemporary of Nonnus, the author of the 'Dionysiaca.' (Schrader's *Preface* to his edition of Musæus, Leeuwarden, 1742.) The poem of 'Hero and Leander' was first discovered about

the thirteenth century. It consists of 340 hexameter lines, which contain the whole account of the beginning of the loves of Leander and Hero, the daring of the former in swimming by night across the strait from Abydos to Sestos to visit his mistress, and the tragical end of both lovers. Ovid has treated the same subject in Latin verse in one of his Heroides, in which Hero writes to Leander to urge him to swim across the Hellespont, as formerly, although the winter had set in, and yet at the same time expresses her fears of his risking his life. The story appears to have been an old tradition of a real fact.

The poem of Musæus has been a favourite with scholars, and has been repeatedly published, commented on, and translated into various languages. Heinrich's edition, Hanover, 1793, and Schäfer's edition, Greek and Latin, Leipzig, 1825, which is an improved republication of Schrader's edition already mentioned, are among the best. The poem has been translated into Italian by Salvini, Pompei, and others; French by Marot, Gail, and Mollevant, Paris, 1805; English, with notes by Stapylton, in 1649, and again in 1797; and into German by Passow, Leipzig, 1810.

MUSÆUS, JOHANN KARL AUGUST, the admired author of the 'Volkmärchen der Deutschen,' or 'Popular Legends of Germany,' was born at Jena in 1735, in which university he studied theology with the intention of taking orders, but did not do so. His first literary production, which appeared in 1760, was his 'Grandison the Second,' a parody on Richardson's celebrated novel, at that period extravagantly admired in Germany. This satirical performance was so well received as to pass through several editions; yet, notwithstanding its success, several years elapsed before the author resumed his pen as a candidate for literary fame; for, in order to eke out his small salary as a professor at the gymnasium of Weimar, he took pupils into his own house, and had consequently little leisure for studious occupation. At length, after an interval of eighteen years, he published his 'Physiognomical Travels,' intended, if not as a satire upon Lavater's system, to correct by wholesome ridicule the extravagant abuse of it into which his countrymen had fallen. The success of this work induced him to throw off his incognito and avow himself the author; whereupon he became the literary idol of the day, and was for awhile an object of attraction to 'lion-hunting' visitors anxious to have a sight of the retired schoolmaster who had mystified them by his pleasantry. This sudden acquisition of celebrity and importance had no other effect upon Musæus than to encourage him to proceed. Accordingly, he forthwith set about his 'Volksmärchen,' which were actually what they professed to be, for he is said, while composing them, to have collected all the stories of the kind he could, from old women at their spinning-wheels, and even from children in the street. But if this circumstance in some measure deprives him of the merit of invention, the fascinating charm of narrative with which he dressed up such homely materials, the humour and naïveté which he imparted to them, were all his own. The success of these popular tales was complete, for they have become a classical and standard work of their kind, while a legion of original novels and romances, all favourites with the public for awhile, have now sunk into utter oblivion. His next production was that entitled 'Freund Heins Erscheinungen, in Holbeins Manier,' a kind of literary 'Dance of Death' (Freund Hein being a jocose appellation for that grim personage), where, in a series of moral and satirical sketches, he shows how many human projects and follies are suddenly cut short by the unwelcome yet inevitable visitor. Excepting a collection of novellettes and tales, entitled 'Straussfedern,' and another for the use of children, 'Freund Hein' was his last work, for he himself had his summons from him about two years after, October 28, 1787.

In 1791 a collection of his posthumous pieces, to which was prefixed 'Some Traits of the Life of the Good Musæus,' was published by his pupil Augustus von Kotzebue. To the epithet so markedly bestowed upon him few have had a better claim than Musæus: a mild philosophy, of which his own life furnished a practical example, together with shrewd good sense and quiet humour, pervades all his writings.

MUSCA (the Fly), a constellation so called by Lacaille, being the Apis of Bayer. It is situated immediately below Crux, and between the latter and the South Pole.

Character.	No. in Catalogue of Flamsteed.	No. in Catalogue of Astron. Society.	Magnitude.
γ	1090	1441	4
α	1092	1453	4
β	1104	1471	4
δ	1119	1494	4

MUSCAT, or MUSKAT. [ARABIA.]

MUSCHELKALK, a calcareous rock interposed in the midst of the new red-sandstone system, receives this name in Germany, and though it is not more carboniferous than some other limestones, yet it is much richer in organic remains than the average of the strata with which it is associated. This rock occupies a considerable space in the vicinity of the Harz, Schwarzwald, and Vosges Mountains, but is unknown in the British Isles, though several small bands of calcareous rock interlaminate the variegated clays of the red-sandstone system. Brown ('Lithæa Geognostica') presents the following synopsis of the strata in this formation, as it appears on the flanks of the Black Forest:—

Keuper formation.

Muschelkalk.	Dolomite	Dolomite (Nagelfels, Malbstein)
	Limestone of Friedrichshall	Pectinite limestone.
		Rogenstein (oolitic).
		Encrinitic limestone.
		Palinurenkalk.
		Encrinitic limestone.
	Anhydrite	Dark clay and anhydrite, with dolomite, swinestone, and rock-salt.
	Wellenkalk	Limestone and dolomitic marls with gypsum and rock-salt.

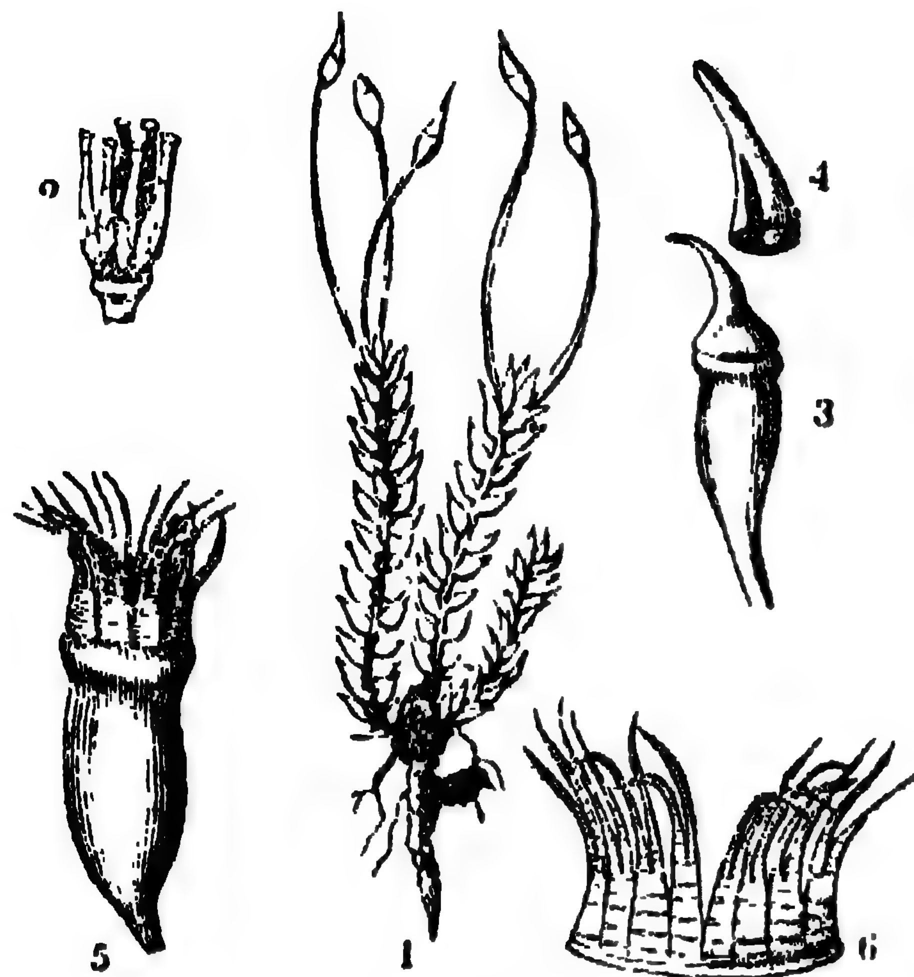
Bunter Sandstein.

The fossil remains of the muschelkalk participate in the more common species of the Bunter sandstein below, and the Keuper above; but among the peculiar species may be reckoned Encrinus moniliformis and Ammonites (ceratites) nodosus. Saurian reptiles occur in this rock.

MUSCI, or MOSSES, constitute a group of cryptogamic or flowerless plants, of considerable extent and of great interest on account of their very singular structure. They are in all cases of small size, never exceeding a few inches in height, and though often of almost microscopical minuteness, are furnished with leaves arranged over a distinct axis of growth, and are propagated by means of reproductive apparatus of a peculiar nature. They have no trace of spiral or other vessels in their tissue, but are formed entirely of cellular tissue, in the stem lengthened into tubes. For long time they were thought to be destitute of a breathing apparatus, but the apertures through which this function is performed have at length been discovered by Treviranus and Unger, and especially by Mr. Valentine. (*Transactions of the Linnean Society*, vol. xviii., p. 239.) It is however remarkable that they should be confined to the organs of fructification, and not found on those of vegetation.

The organs of fructification are of two kinds; the most universal and most conspicuous is the urn (*sporangium*, or *theca*) in which the spores, or seed-like bodies, are generated. If the axils of the leaves of a moss are examined at the proper season of the year, there will be found in some of them clusters of articulated filaments swollen at the base, from among which some one will be larger than the remainder, and go on growing while they are arrested in their development. After awhile this body is found to have an exterior membranous coating, which separates from the base by a circular incision, but which otherwise adheres to the part beneath it. The latter, which is the young urn, gradually acquires a stalk, called the *seta*, upon which it is elevated above the leaves, carrying the outer membrane upwards on its point, so that when full grown it is covered by it as with a cap; then called a *calyptra*. The urn itself is closed by a lid, or *operculum*, and contains the spores arranged in a cavity surrounding a central column, or *columella*. Its rim is bordered by a double row of processes,

often resembling jointed teeth, and called the peristome; one set of which appears to belong to the outer shell of the urn, and the other to the inner. Usually the urn grows from a fleshy tubercle called the *apophysis*, the station of which is in most cases at the base of the seta, but in Splanchnum forms a curious process at the apex of the seta, immediately below the urn

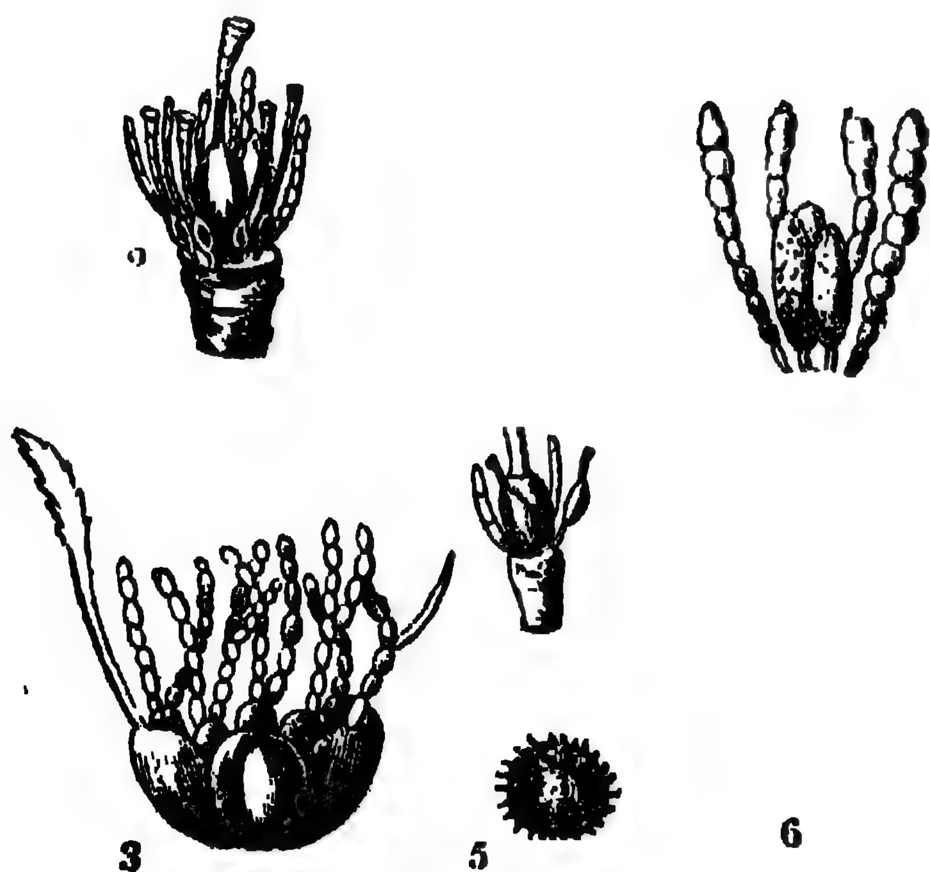


Fissidens Adiantoides.

1, an entire plant, much magnified; 2. a cluster of young urns; 3, an urn, full grown, with its calyptra, 4, removed; 5, the urn with the operculum fallen off, 6, a portion of the peristome.

In some mosses there occur organs of a second kind, by some supposed to be male, but whose use is really unknown, to which the name of *antheridia* or *staminidia* has been applied. These are also found clustered in the axils of leaves; they consist of membranous, cylindrical, jointed or jointless bodies, irregularly opening at the point, and discharging a mucous turbid fluid; they are surrounded by *paraphyses*, or jointed filaments, like the urns themselves.

When the spores of mosses germinate, they produce a jointed filament from any part of their surface, of which one part rises upwards, forming the beginning of a stem, while the other is directed downwards as a root; from the axils of the branches of the stem-filament the leaves are eventually developed.



Gymnostomum Ovatum.

1. a seta, bearing on the apex an urn, from which the operculum is rising. proceeding from an apophysis at the base, where it is surrounded by paraphyses; 2, a group of young urns, among which a few paraphyses are mixed; 3, a cluster of staminidia and paraphyses, surrounded by scale-like leaves; 4, three staminidia surrounded by four paraphyses; 5. a spore; 6, the same in the first stage of germination; 7, the same in a more advanced state.

The genera of mosses are principally characterised by peculiarities in the peristome, or by modifications of the calyptra, and of the position of the urn. Linnæus admitted very few genera, but modern muscologists have elevated the number to more than 120; concerning the goodness of which there is however some difference of opinion. In the most recent enumeration of the genera the old order Musci is broken up into three: of which ANDREÆACEÆ have an urn splitting into four valves; SPHAGNACEÆ, a valveless urn, a calyptra separating in the middle, and a toothed ring surrounding the peristome; BRYACEÆ, a valveless urn, a calyptra separating at the base, and a ringless peristome.

Mosses are among the first plants that spring up on the surface of inorganic matter, at first appearing like a green stain, when they merely consist of germinating spores, but soon clothing themselves with leaves and then by their decay producing the earliest portion of decomposed vegetable matter with which the soil is fertilised. (Bridel, *Bryologia Universalis;* Hedwig, *Theoria Generationis, &c. Plantarum Cryptogamicarum;* Endlicher, *Genera Plantarum* Hooker and Taylor, *Muscologia Britannica.*)

MUSCICA'PIDÆ, *Flycatchers;* a family of insectivorous birds, so named from their mode of taking their prey. Thus, M. Temminck states, that the Flycatchers (*Gobe-mouches*) feed entirely on flies and other winged insects, which they catch as they fly (*Manuel d'Ornithologie*); and our countryman White says, 'There is one circumstance characteristic of this bird (the Spotted Flycatcher, *Muscicapa grisola*) which seems to have escaped observation; and that is, it takes its stand on the top of some stake or post, from whence it springs forth on its prey, catching a fly in the air, and hardly ever touching the ground, but returning still to the same stand for many times together.' (*Nat. Hist. of Selborne.*)

Linnæus, in his last edition of the *Systema Naturæ*, places the genus *Muscicapa*, containing the true flycatchers, the *Tyrants* (*Muscicapa Tyrannus*), and several other species, to the amount of twenty-one, between the genera *Fringilla* and *Motacilla.*

Cuvier places the *Gobe-mouches* (*Muscicapa*, Linn.) between the *Pies Grièches* (Butcher-birds, *Lanius*, Linn.) and the *Cotingas* (*Ampelis*, Linn.).

He describes the group as having the bill depressed horizontally, and furnished with hairs or *vibrissæ* at its base, and its point more or less hooked and notched; and he makes the Flycatchers consist of the *Tyrants* (*Tyrannus*, Linn.); the *Moucheroles* (*Muscipeta*, Cuv.); the *Platyrhynques or Broad-bills;* certain species high on the legs and with a short tail (*Turdus auritus*, Gm.—*Conopophaga*, Vieillot); the *True Flycatchers* (*Muscicapa*, Cuv.); and other variations of form, principally in the bill, which becomes more slender in some, thus approximating to the *Figuiers*, and, in others, has the *arête* a little more elevated, whilst it is curved towards the point, thus leading to *Saxicola.* Cuvier finishes by observing that there are various genera or subgenera which come very near to certain links of the series of Flycatchers, though they much surpass those birds in size, such as the *Bald Tyrants* (*Gymnocephalus*, Geoff.), and *Cephalopterus* (Geoff.). [CORACINA, vol. viii., pp. 4, 5.]

M. Temminck places his genus *Gobe-mouche* (*Muscicapa*, Linn.) between *Lanius* (Linn.) and *Turdus* (Linn.).

M. Vieillot places the *Myothères* or Flycatchers between the *Chélidons* (Swallows and Gootsuckers) and the *Collurions* (Butcher-birds).

Mr. Vigors, at the commencement of the section treating of the order *Dentirostres*, observes that the depressed bill and insect-food of the *Todidæ* introduce us at once to the *Muscicapidæ*, with which they are immediately connected by the genus *Platyrhynchus*, Desm. The species that compose the latter group were, he remarks, originally included in the genus *Todus*, and were separated from it only on account of the comparative strength of their legs. 'The whole of the *Muscicapidæ*, indeed,' continues Mr. Vigors, 'with which family *Platyrhynchus* is now united, have a decided affinity to the last tribe, or the birds which feed upon the wing, in their broad-based bills, the *vibrissæ* that surround them, and their similar habits of darting upon their prey while on the wing. Separated from them chiefly by the strength and more perfect structure of the leg and foot, they form the extreme of the succeeding tribe, in which they are numbered in consequence of these distinguishing characters. The line of affinity between the two tribes may thus be assumed as established.' Mr. Vigors then states that the families composing the order *Dentirostres* appear to succeed each other as follows:—*Muscicapidæ; Laniadæ; Merulidæ; Sylviadæ; Pipridæ.* These families are thus grouped by him in their typical disposition:—

Normal Group

Rostris fortioribus . . { *Laniadæ. Merulidæ.*

Aberrant Group.

Rostris debilioribus . . . . { *Sylviadæ. Pipridæ. Muscicapidæ.*

He further remarks that the *Muscicapidæ* contain a multitude of species, diffused over every quarter of the globe, and differing in many points of generic distinction; but hitherto so ill-defined, and so unsatisfactorily grouped, that any attempt to trace them in detail through their affinities in their present confusion would be hopeless. They are all however, he adds, well united together by the essential characters which distinguish the type of the group—the notched, depressed, and angular bill, and the strong hairs or vibrissæ that surround its base. In these characters, as well as in their manners, they partially correspond with the *Laniadæ*, from the earlier families of which they chiefly differ in their inferior power and robustness. Mr. Vigors then enters among the *Laniadæ* by the genus *Tyrannus*, Cuv., which, in his opinion, unites them with the *Muscicapidæ*, in which family indeed that genus has generally been classed, and from which he would separate it, chiefly on account of the strength of the bill, wherein the character of a *Shrike* is more conspicuous than that of a *Flycatcher*.

M. Lesson makes the Muscicapidæ consist of the genera *Tyrannus, Monacha, Eurylaimus, Platyrhynchus, Todus, Myiagra, Muscicapa, Alectrurus, Drymophila, Formicivora, Rhipidura, Seisura, Psophodes*, and *Enicurus*.

Mr. Swainson (*Classification of Birds*) is of opinion that the Water-chats (*Fluvicolinæ*) seem to connect the Tyrant Shrikes with the Flycatching family, or *Muscicapidæ*, the most insectivorous of the *Dentirostres;* a group, he remarks, hardly less numerous than that of the Warblers, and composed, like them, almost entirely of small birds. Both families, he continues, are insectivorous, that is, habitual devourers of insects; but very many of the warblers (even in the more typical genera) feed also upon fruits, of which the robin, the blackcap, and the whitethroat are notable examples. 'The Flycatchers however,' adds Mr. Swainson, 'properly so called, seem to be strictly and exclusively insectivorous, or, at least, it has not yet been ascertained that any of the species composing the typical group *Muscicapinæ* ever partake of fruits. This peculiarity of diet, independent of many others, separates them from the warblers on one side, and from the *Ampelidæ*, or Chatterers, on the other; while another is to be found in the mode or manner of their feeding. The warblers fly about, hunting down their prey, searching among trees, and roaming from place to place after their favourite food; hence they become ambulating flycatchers, and their feet are consequently large and strong in comparison to the size of their bodies. We need only look to the gold-crested and wood warblers as exemplifications of this remark, even among those species which frequent trees; but in such, as in the Stonechats, *Saxicolinæ*, and *Motacillinæ*, as habitually walk, the feet are much stronger and the shanks more lengthened. Now, the very reverse of this structure is the typical distinction of the Flycatchers; their legs are remarkably small and *weak*,—more so, perhaps, than those of any dentirostral birds,—showing at once that their feet are but little used; and such we find to be the case. The Flycatchers constitute the fissirostral type of form among the leading divisions of the *Dentirostres*, and they consequently exhibit all the chief indications of that primary type of nature, as it is exhibited in the feathered creation. These, as the intelligent ornithologist already knows, are manifested in a large and rather wide mouth and bill; short, feeble, and often imperfect feet; great powers of flight and often a considerable length of wing: the development of this latter structure is not always apparent, but it is the peculiar power of their flight upon which they chiefly depend for procuring subsistence. They are mostly sedentary, and only dart upon such insects as come within a sudden swoop, without attempting to pursue their game further, if unsuccessful in the first instance: they return, in fact, to the spot they left, or to another very near, and there await patiently until another insect passes within the proper distance. This habit of feeding at once explains the reason of the feet being so small and weak, by showing that they are merely used to support the body; or, at least, that they are not employed in constant exercise or exertion, as in the generality of other birds. Other characters accompany these, no less indicative of birds which feed exclusively upon the wing: the bill is always considerably depressed or flattened, particularly at its base; and the sides of the mouth are defended with stiff bristles, to confine the struggles of their prey.'

Mr. Swainson thinks that the primary divisions appear to be represented by the genera *Eurylaimus, Muscicapa, Fluvicola, Psaris*, and *Querula*, and these, according to his views, constitute the types of so many subfamilies, very unequal indeed in their contents, yet blending sufficiently into each other to point out their circular succession. He considers the first two of these to be the typical and subtypical groups; and the three next to be aberrant.

The Prince of Musignano (*Geographical and Comparative List*) places the *Muscicapidæ* between the *Turdidæ* and the *Laniadæ;* and he makes the *Muscicapidæ* consist of the following subfamilies and genera.

a.

Muscicapinæ.

Genera:—*Setophaga*, Sw. *Tyrannula*, Sw. *Tyrannus*, Vieill. *Milvulus*, Sw. *Butalis*, Boie. *Muscicapa*, Linn. *Erythrosterna*, Bonap.

b.

Vireoninæ.

Genera:—*Icteria*, Vieill. *Vireo*, Vieill. *Vireosylva*, Bonap.

In considering this arrangement, the student should remember that it only applies to the birds of Europe and North America.

Mr. Swainson thus defines the family:—

Stature small. Bill considerably depressed its entire length, broad: the edge of the upper mandible folding over that of the lower; the tip abruptly bent and notched. Rictus wide, defended with strong rigid bristles pointing forwards. Feet almost always short (except in the rasorial types, where of course they are longer), small, and weak. Feed solely upon insects captured during flight. Habits sedentary.

Subfamily *Querulinæ.*

Bill strong, broad, much depressed; gape wide. Rictus with strong bristles. Feet short, resembling those of the typical *Ampelinæ*. Lateral scales minute. (Sw.)

Mr. Swainson is of opinion that the genus *Querula* is the type of this family, and he observes that by some of the Linnean writers this remarkable bird is classed as a *Muscicapa;* while by others, even among the moderns, it is considered an *Ampelis;* and he thinks that both of these opinions may be reconciled, by viewing it—as it stands in his arrangement—as the connecting link between these families. He remarks that all the other Flycatchers, according to his system, so far as we yet know, feed entirely upon insects; but there is unquestionable testimony that this species lives also upon fruits, thus uniting in itself the characteristic of the two families which it connects. In the bill, he adds, there is much of the form and strength of that of *Psaris*, but it is wide and more depressed; whilst the stiff bristles at the rictus betray its insectivorous habit: the feet are remarkably short for the size of the bird, and are calculated only, like those of the *Ampelidæ*, for perching. All these characters, in the opinion of Mr. Swainson, not only point out this genus as the fissirostral type, but perfect the union of the families of *Muscicapidæ* and *Ampelidæ*.

Genera.

Querula, Vieill. and *Lathria*, Sw. Of these we select the former as an example.

Generic Character.—Bill large, broad, and strong. Gonys long and straight. Nostrils concealed by incumbent reflected feathers. Wings long and broad, fourth quill longest. Toes unequal; inner toe shortest, of equal length with the hind toe. Tail even.

Example, *Querula rubricollis, The Common Piahau.*

Description.—Black with a purple throat. It is the *Muscicapa rubricollis* of Gmelin.

Locality and Habits.—America, where they go in troops in the woods in pursuit of insects.



Querula Rubricollis.

Psarianæ.

Bill large, thick, subcylindrical. Culmen convex, and without any ridge; the tip abruptly bent and notched. Head large, depressed. Mouth very wide. Feet weak: lateral toes unequal; interior scales of the tarsi transverse; lateral scales small, numerous. Wings long.



Psaris Cayanensis.

Mr. Swainson (who gives the above as the characters of the subfamily to which, in his opinion, *Alectrura* immediately leads) states that in the *Psarianæ* there are but three ascertained genera. 'These birds,' says Mr. Swainson, 'like their representatives, *Monacha* and *Psarisoma*, depart considerably from the types of this family: the bill is less depressed than in any other of the flycatchers, and its structure is altogether stronger and thicker; they are all natives of Tropical America, and are generally found only in thick forests. *Gubernetes* is the genus by which they appear to be connected with the waterchats, through the medium of *Alectrura*. One species only is yet known, the *Gubernetes forficatus*, remarkable for its long forked tail: to this succeeds *Psaris*, where we find nearly all the species coloured alike; that is, they are more or less of a grey or pearl white, with black head, wings, and tail: they remind us immediately of the gulls, and this analogy is one of the most beautiful, when worked out, in the whole family. The smaller birds of the genus *Pachyrynchus* immediately follow. Two or three already prepare us for the next* division (*Querulinæ*), by the great depression of their bills, and the singularly formed red feathers on the throat.' (*Classification of Birds*, part iii.) In the *Synopsis* (part iv.) only two genera are given, *Psaris*, Cuv., and *Pachyrynchus*, Spix. Of these we select *Psaris* as an example.

Generic Character.—Bill large. The rictus smooth, often naked round the eye. Wings lengthened; the first quill equal to or longer than the fourth. Tail short, even. Inner toe shorter than the outer. (Sw.)

Example, *Psaris Cayanensis*.

Description.—Ash-coloured · head, wings, and tail black. This is the *Lanius Cayanensis cinereus* of Brisson; *Lanius Cayanus* of Linnæus and Gmelin; *Pie-grièche grise de Cayenne* of Buffon; *Cayenne Shrike* of Latham; and is the type of Cuvier's genus *Psaris*.

Locality and Habits.—South America., Cayenne particularly. Cuvier says that its manners are those of the *Shrikes*.

Fluvicolinæ.

Legs formed for walking. Tarsi lengthened, strong. Inhabit the sides of marshes and rivers in Tropical America. *Seisura* alone is Australian. (Sw.)

Mr. Swainson states that the *Fluvicolinæ*, or waterchats, with the exception of one genus, whose situation is still somewhat doubtful, are entirely restricted to the warm latitudes of America, where they seem to represent the stonechats and the wagtails of the Old World. 'They are,' continues this author, 'strictly ambulating Flycatchers, and constitute the rasorial division of this family. The legs are consequently very long, and formed especially for walking; the toes are also long, quite divided to their base, and furnished with long and slightly curved claws. This structure enables these birds to run with great celerity; and they are generally seen on the sides of streams and rivers, feeding upon flying insects which resort to such situations; for they never hunt among trees, and rarely perch; such at least are the manners of the typical species; but there are of course various modifications of habit, corresponding to those, which will now be glanced at, in their structure.' Mr. Swainson exhibits some variation in his views as to this group in the third and fourth parts of the *Classification of Birds*. In the third part the first genus, with which he begins the series, is that of *Seisura*, differing only from *Rhipidura* by its more lengthened bill and feet: indeed he by no means feels satisfied that *Seisura* is naturally separated from *Rhipidura*, although, for the present, he adopts the group as proposed by Mr. Vigors and Dr. Horsfield. He nevertheless expresses his suspicion that *all* the genera of the *Fluvicolinæ* may prove to be natives of Tropical America, and that *Seisura* is only composed of aberrant species of *Rhipidura* which pass into the *Fluvicolinæ*. Both these divisions (*Seisura* and *Rhipidura*), as well as that of *Seicircus*, have broad fan-shaped tails, which, he observes, plainly indicate the type to which they belong, although the rank they respectively hold cannot, in our present state of knowledge, be clearly ascertained. 'Leaving this group,' says Mr. Swainson in continuation, 'we reach that of *Fluvicola*, by means of certain black and glossy birds of Brazil, some of which have distinct crests: these latter conduct us to the typical *Fluvicolæ*, having the legs unusually long, the bill depressed, the tail lengthened, and the plumage differently varied with white and black. One of the most characteristic of these singular birds is the *Fluvicola cursoria*, of the size of a lark; but some are nearly equal to a small thrush. *Perspicilla*, so called from the naked fleshy lobe which surrounds the eyes like spectacles, is the next genus this is succeeded by *Alectrura*, one of the most distinct and well defined groups in the whole circle of ornithology: the remarkable development of the tail-feathers in this group only finds a parallel in the genus *Vidua* among the finches and that of *Gallus* on the rasorial circle. Besides these genera, there are several black and white coloured birds

* In the third part of Mr. Swainson's 'Classification of Birds,' the subfamilies stand in the following order:—*Eurylaiminæ, Muscicapinæ, Fluvicolinæ Psarianæ, Querulinæ.* In the fourth part ('Synopsis') they are thus arranged:—*Querulinæ, Psarianæ, Fluvicolinæ, Muscicapinæ, Eurylaiminæ.*

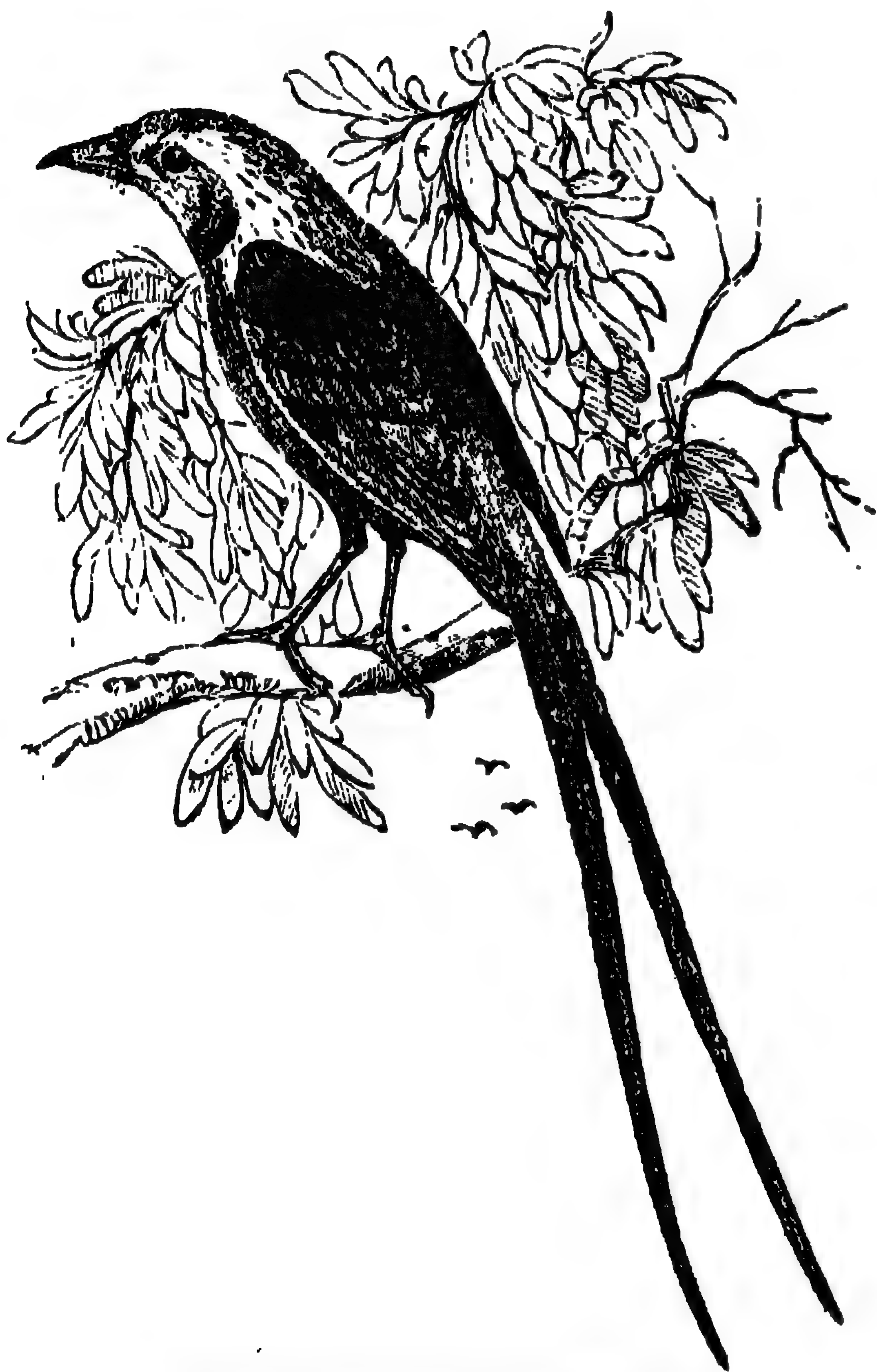
having a general resemblance to the foregoing, which would seem to enter among the waterchats; yet, as we have not sufficiently analyzed the group, we must leave this point undetermined: among these are the white-headed tody of the old writers, which is either a *Tyrannula* or an aberrant *Fluvicola*, as well as the *Muscicapa leucocilla* of Hahn, which, in outward appearance, so much resembles a manakin, that it may possibly prove a *representative* of that family in the present circle.' In the fourth part the subfamily is made to consist of the following genera, arranged in the order here given:—

Gubernetes, Vig. *Alectrurus*, Vieill. *Fluvicola*, Sw. (with its subgenus *Blechropus*, Sw. *Pepoaza*, D'Azar.). *Seisura*, Horsf. and Vig. *Perspicilla*, Sw. Of these we select *Gubernetes*.

Generic Character.—*Bill* thick, subdepressed, raised at the base, culmen rounded; upper mandible slightly notched at the apex; nostrils rounded; the rictus furnished with close-set rigid vibrissæ. *Wings* moderate; quills, from the 1st to the 5th nearly equal, the first the shortest, the second the longest; the external beards (pogoniis), except the beards of the first feather, notched in the middle; internal beards entire. *Feet* with moderate tarsi; the acrotarsia and paratarsia scutellated; soles reticulated with oval scales. *Tail* very long and forked. (Vig.)

Example, *Gubernetes Cunninghami.*

Description.—Ash-coloured, longitudinally lineated with brown, throat and rump white, lunulated pectoral band purplish-brown, wings and tail brownish-black; quills longitudinally banded with ferruginous.



Gubernetes Cunninghami. (Vig., *Zool. Journ.*)

Mr. Vigors, whose generic and specific descriptions we have given above, says that this bird, which he named after Colonel Cunningham of Rio Janeiro, appears to have a considerable affinity to the genus *Psaris* of Cuvier in the structure of its bill and wings, but that it differs from it by other such essential characters, as to have induced Mr. Vigors to place it in a separate genus. Besides the difference in the structure of the tail, an important character, he observes, in the group of the *Laniadæ*, which still retain some of the powers of flight belonging to the *Fissirostres*, he notes the following differences between the two forms. The rictal bristles of his bird are strong and numerous, while in Psaris they are scarcely perceptible. The *tarsi*, though somewhat weaker than those of *Psaris*, are in a slight degree weaker, while the toes are longer and stronger The lateral scales of the tarsi are square and far asunder, while in *Psaris* they are rounded and numerous. The hinder scales also are less rounded, less close, and less conspicuous than in the latter genus. (*Zool. Journ.*, vol. ii.)

Muscicapinæ.

Feet weak, formed only for perching, generally short (excepting in *Todus*), but always very slender, and often syndactyle. Bill more or less depressed. Gape with stiff bristles. Claws small, considerably curved. Lateral toes unequal. Inhabits warm and tropical latitudes, but excluded from North America. (Sw.)

This extensive subfamily contains the ordinary Flycatchers, the generality of which do not exceed the dimensions of *Muscicapa grisola*. Mr. Swainson remarks that the bill, although it is rarely so broad as in the *Eurylaiminæ*, is much more flattened, and the bristles at the gape are more developed. 'Their whole structure also,' continues Mr. Swainson, 'is more slight and delicate; but their colouring, although sometimes elegant, is almost devoid of vivid tints. The different form and length of the bill and feet furnish the characters by which the genera and subgenera are distinguished; while the species, which are exceedingly numerous, with the exception of the genus *Todus*, are only found in the Old World. The typical genera are *Todus* and *Muscicapa*; the aberrant are *Megalophus*, *Monacha*, and *Rhipidura*: the two first are so numerous in species as to contain subgenera.' Mr. Swainson then enters into a lengthened notice of the different genera and subgenera; exhibits the circle of *Todus*, which he considers to be complete with that of *Muscicapa*; and gives the following as a table, showing the comparison of *Todus* with the orders of birds, and the tribes of the *Perchers*.

Subgenera of Todus.	Genus Todus. Analogies.	Tribes of Perchers.	Orders of Birds.
Todus.	Bill lengthened, conic, slightly notched.	Conirostres.	Insessores.
Platyrhynchus.	Bill short; tip abruptly hooked; notch or tooth very distinct.	Dentirostres.	Raptores.
Conopophaga.	Feet syndactyle; head large.	Fissirostres.	Natatores.
Platystera.	Bill slender.	Tenuirostres.	Grallatores.
Lepturus.	Feet large; toes cleft; wings short; tail long.	Scansores	Rasores.

This illustration Mr. Swainson considers to be perfect. (*Classification of Birds*, part iii.)

The genera and subgenera of the *Muscicapinæ* are, in the fourth part of the work last quoted, placed in the following order:—

Rhipidura, Horsf. and Vig.; *Monacha*, Horsf. and Vig.; *Megalophus*, Sw.; *Todus*, Auct. (with the following subgenera:—*Conopophaga*, Vieill.; *Platyrhynchus*, Desm.; *Todus*, Linn.; *Lepturus*, Sw.; *Platystera*, Jard. and Selby); *Muscicapa*, Linn. (with the following subgenera:—*Cryptolopha*,* Sw.; *Muscipeta*, Cuv.; *Myiagra*, Horsf. and Vig.; *Muscicapa*, Linn.; and *Hyliota*, Sw.).

Our limits will not permit more than a selection of some of these forms, and we must confine ourselves in this article to an attempt to illustrate those of *Rhipidura*, *Todus*, and *Muscicapa*.

Rhipidura.

Generic Character.—Bill short, depressed, broad at the base, compressed at the apex, the culmen arched; upper mandible notched at the apex; *nostrils* basal, oval, nearly covered with bristles and plumules; *rictus* furnished with close-set bristles, generally exceeding the mandibles in length. *Wings* moderate, subacuminate; the first quill shortest, the second longer by twice, the third and fourth (which last is the longest) gradually longer. *Tail* elongated, patulous, rounded at the tip. *Feet* moderate, slender; the *acrotarsia* and *paratarsia* entire. (Vig. and Horsf.)

Example, *Rhipidura flabellifera.*

Description.—Brown-black; superciliary and postocular spot, throat, points of the wing-coverts, and stems and tips of the tail-feathers white; abdomen inclining to ferruginous. (V. and H.) This is the *Muscicapa flabellifera* of Gmelin; the *Fan-tailed Flycatcher* of Latham.

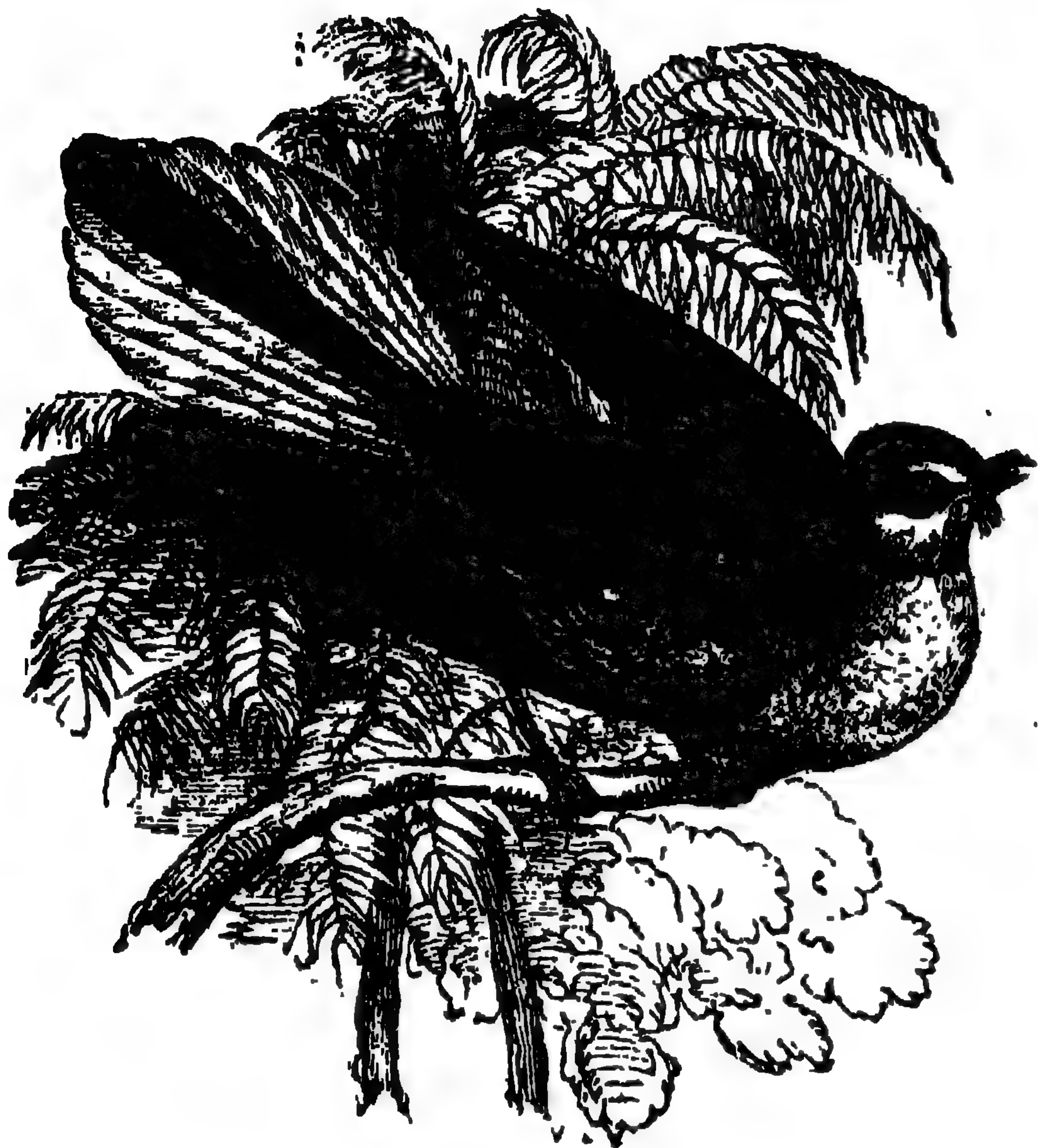
Mr. Vigors and Dr. Horsfield remark that the figure of this species given by Dr. Latham has much more white on

* Substituted for *Seicircus*.

the lateral tail-feathers than the bird described by them, but they add that the Dr. affirms that the species is subject to much variation.

Habits.—Mr. Caley, speaking of this species under the name of *Fan-tail*, says, 'There is something singular in the habits of this bird. It frequents the small trees and bushes, from whence it suddenly darts at its prey, spreading out its tail like a fan, and, to appearance, turning over like a *tumbler Pigeon*, and then immediately returning to the same twig or bough from whence it sprung. These actions it continues constantly to repeat. The skin is very tender; and it is difficult, after having taken it off the body, to restore it again to its proper shape.'

Localities.—Australia. Mr. Caley says that the species is very common about Paramatta, and he does not recollect having missed it at any period of the year. Gmelin, quoting Forster, gives New Zealand as the habitat.



Rhipidura flabellifera.

Todus.

Generic Character.—Bill lengthened, broad throughout, contracting suddenly at the tip, very flat. Bristles short, weak, or none. Tail short, very slender, rounded. Legs long, weak. Toes short; the outer more or less united to the middle one. Tropical America only. (Sw.)

Example, *Todus viridis.*

Description.—Bright-green above, whitish beneath; throat scarlet; sides rosy; lower tail-coverts yellow. This species appears to be the *Rubecula viridis elegantissima, Green Sparrow*, or *Green Humming-bird* of Sloane (*Jam.*, vol. 2, p. 306; Ray, *Syn. Append.*, p. 187); *Todus viridis, pectore rubro, rostro recto* of Brown (*Jam.*, p. 476); *Todier de St. Domingue* of Buffon; the *Green Tody* of English authors.

Habits, Food, &c.—Sloane says of this specimen that the belly or stomach was pretty thick, and very well filled with *cimices* and small vermin of the like kind. It loves, he adds, melancholy places, and scarce will stir from any one till they take it. 'It is,' says Sloane in conclusion, 'one of the most beautiful small birds I ever saw.' Browne states that it is a very familiar and beautiful bird, and will often let a man come within a few feet, and look for minutes together at it, before it moves. 'It keeps,' he adds, 'much about houses in the country parts, flies very slow, and probably may be easily tamed.'

M. Lesson, who places the genus with doubt between *Platyrhynchus* and *Myiagra*, says that the birds composing the genus have the greatest approximations to the Kingfishers, near which, and in the syndactylous tribe, Cuvier has arranged them. M. Lesson is of opinion that they are united to the Kingfishers by his genus *Todiramphus*, though he at the same time observes that M. Temminck admits only one Tody, viz. *Todus viridis*, placing it near *Platyrhynchus* and before the *Moucherolles*, an opinion which appears to M. Lesson to be well founded. The Todies, he adds, are very small birds of America, living upon insects which they catch in the mud or in the water. 'They are,' says he, 'in truth, water *Moucherolles*; their wide and flattened bill, furnished with asperities, or teeth, permits them to sift the mud and retain their prey: they also seek for small insects under the moss and on the banks of small streams.'

The bird is placed by Mr. Vigors among the *Fissirostres*.

Locality.—The Antilles.



Todus viridis.*

Muscicapa. (*Butalis*, Boie.)

Generic Character.—*Bill* moderate, triangular, and not much dilated at the base, which is furnished with long and stiff hairs. *Nostrils* basal, lateral, ovoid, partially covered with hairs directed forwards. *Wings* rather pointed; first quill small and spurious, second rather shorter than the third and fourth, which are the longest. *Tail* rather short or moderate, even or slightly forked. *Feet* rather strong; tarsus and middle toe lengthened; inner toe almost as long as the outer toe.

Example, *Muscicapa grisola.*

Description.—All the upper parts ash-brown; forehead approaching to whitish; a longitudinal stripe of a deep brown on the head; throat and middle of the belly white, sides of the neck, breast and sides sprinkled with longitudinal stains of ash-brown.

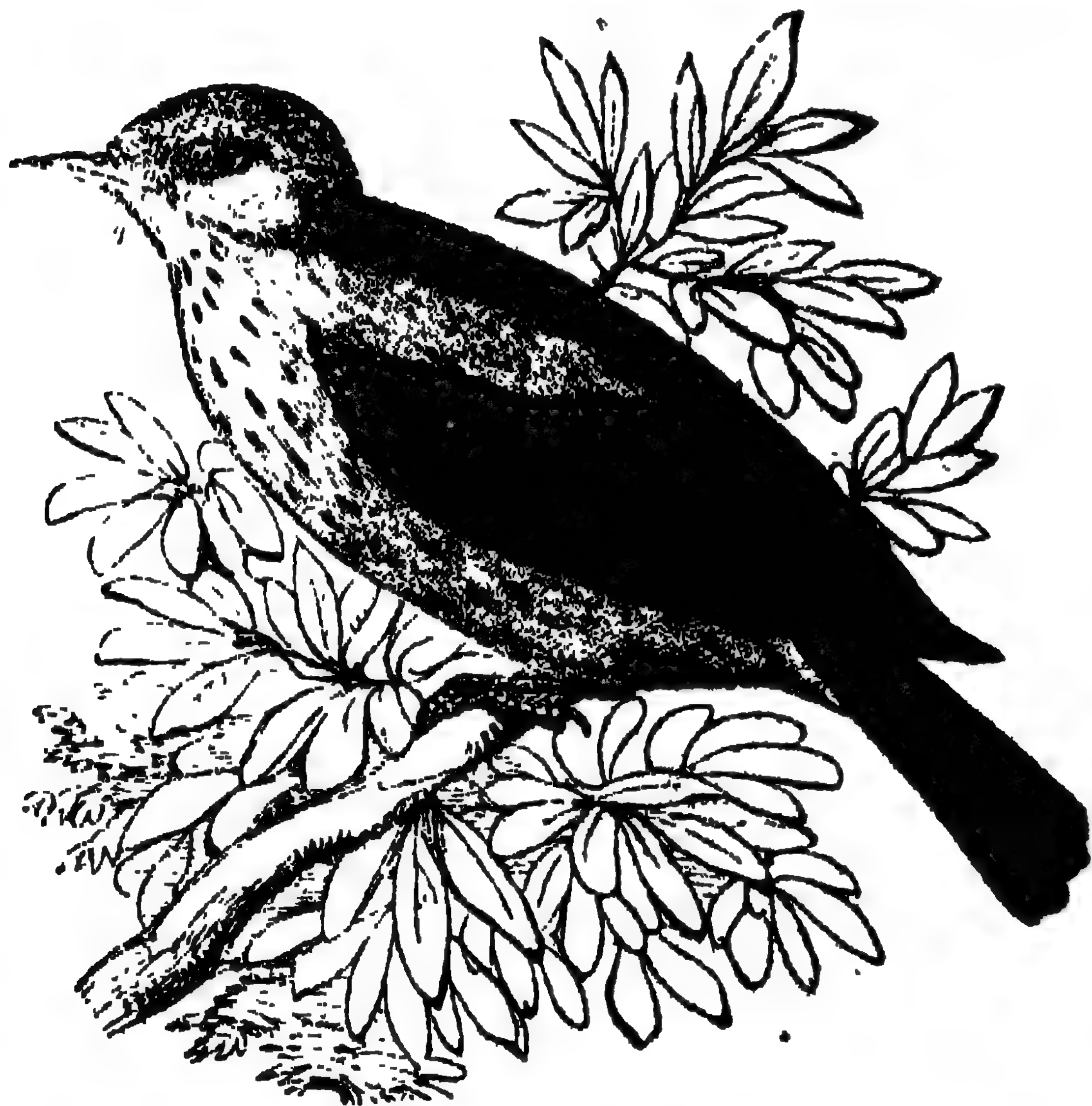
This is the *Gobe-mouche proprement dit* of Buffon; *Gobe-mouche gris* of Temminck: *Fliegenfänger* and *Gefleckter Fliegenfänger* of the Germans; *Stoparola* of Aldrovandus and Ray; *y Gwybedog* of the antient British; *Spotted Flycatcher* and (provincial) *Beam-bird, Rafter, Post-bird*, &c., of the modern British.

Geographical Distribution, Food, Habits, Reproduction.—The Spotted Flycatcher, one of the latest of our summer visitants, rarely arrives in these islands before the latter part of May, when its insect food, which consists principally of flies and other dipterous insects, abounds. Its mode of capturing them is well described by White in the passage quoted at the commencement of this article. Temminck says that it rarely eats caterpillars and ants. Pennant states that it is very fond of cherries; but Mr. Selby says that he has not been able to verify this, and that he is inclined to believe that the Greater Pettychaps (*Sylvia hortensis*), a

* The attitudes are taken from the figures in Mr. Swainson's second series of 'Zoological Illustrations,' as being the most characteristic known to us.

keen devourer of all the smaller fruits, has in most instances been mistaken for the present bird. The same author tells us that it is of rare occurrence in Scotland; Mr. Gould says that it is found throughout England and a portion of Scotland, wherever there exists a locality suitable to its economy. It quits us in September and October, having bred and brought up its young here. M. Temminck says that it is spread in Europe as far as Sweden, and that it is found in the temperate provinces of Russia; but that it is rare in Holland. Mr. Selby states that its summer or polar migration extends as far as Sweden and Norway. The Prince of Musignano (*Specchio Comparativo*) notes it as rare in the summer near Rome; and as found in Europe generally. (*Geographical and Comparative List.*) Mr. Gould says, 'The Spotted Flycatcher appears to enjoy a wide range over the continent of Europe, being generally dispersed from the border of the Arctic circle to its most southern boundary; and we have also frequently observed it among collections from India.' The nest, loosely constructed of moss, fibres, catkins of the hazel, or small twigs lined with straw and wool or hair and feathers, is often placed upon the jutting ends of beams and rafters in toolhouses, or other garden or farm buildings, whence its name of *Beam-bird.* The four or five eggs are greyish-white, with pale orange-brown spots. When the young are able to leave the nest, the parents lead them to some place where insects abound. There the young soon learn to capture their prey after the manner of the old birds.

The sexes are alike in plumage. The young, for a short time after they begin to fly, have the feathers tipped with yellowish-white, which gives them a mottled appearance. The chirp of this Flycatcher, its only note, is weak.



Muscicapa Grisola (male).

Eurylaiminæ.

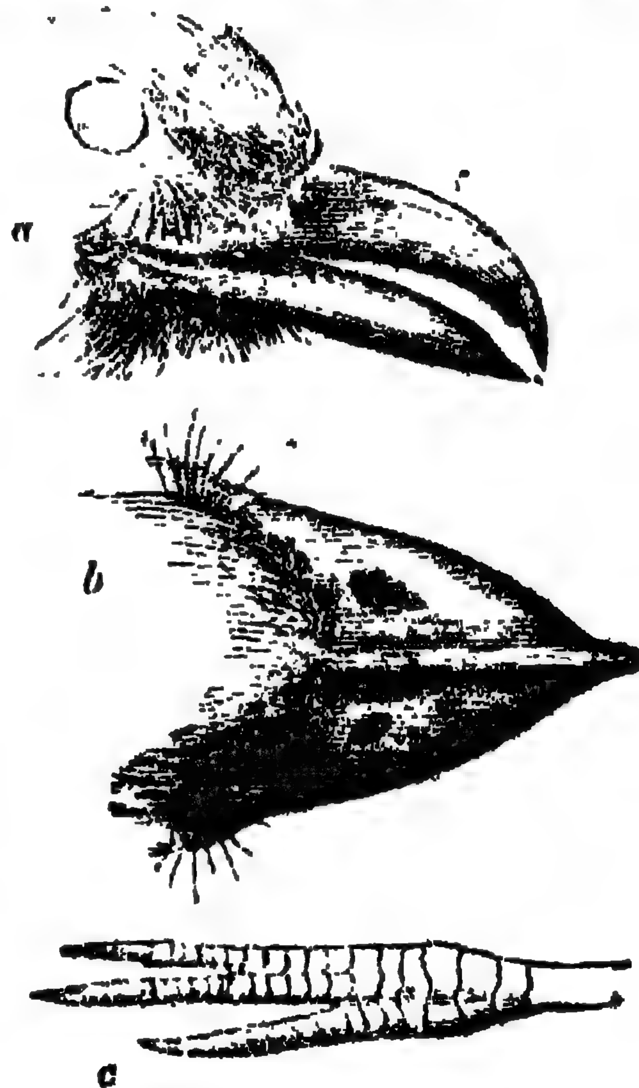
Size large. Structure powerful. Bill short, excessively broad; the upper mandible convex above, dilated at its base, and the margins folding over those of the upper mandible; the tip abruptly hooked. Wings rather short. Feet strong, moderate. The outer toe connected for half its length to the middle toe; hinder toe long; inner toe shortest.

Mr. Swainson, who gives this as the character of the subfamily, observes that the *Eurylaiminæ* are the most remarkable birds of the whole family; the species are very few, and their geographical limits seem to be restricted to the hottest parts of India, where they inhabit the forests. 'In size,' continues Mr. Swainson, 'they exceed all others, save the genus *Querula*, in this family, being about the size of starlings, while the enormous breadth of their bills and the peculiar brightness of their colouring render it impossible for the student to mistake them for any other genus. The bill is not only excessively broad, but the margins of the base are so dilated that they often project over those of the lower mandible, while its substance seems much more solid than in the ordinary Flycatchers. Although very few species have hitherto been discovered, it is quite clear that the five leading types have come to light, although only one example of the genera *Serilophus*, *Psarisoma*, and *Platystoma*, are yet known. It may here be observed that notwithstanding the great width of the bill in all these birds, it is nevertheless much more convex above, and in some instances is even more raised on the culmen than any of the others; the feet also and the whole structure of the body are more robust. Hence, although the width of the mouth and the great size of the head would indicate this to be the pre-eminent typical group, yet all the other characters would place it as the typical. *Serilophus* is evidently the rasorial or crested type; and it departs considerably from the others by the only species yet known being very fond of fruits; this is in conformity with the strong and remarkable analogy it shows, even in its outward appearance, to the wax-winged chatterers (*Bombycilla*).'

The genera given by Mr. Swainson in the 'Synopsis' are —*Eurylaimus*, Horsf.; *Cymbirhynchus*, Vig.; *Platystomus*, Sw. (both of which are placed by M. Lesson in his genus *Erolla*); *Psarisomus*, Sw.; and *Serilophus*, Sw. Mr. Swainson considers *Eurylaimus* to be the pre-eminent type; *Cymbirhynchus* the subtypical type; *Platystomus* the fissirostral type; and *Serilophus* the rasorial type; by which last and *Megalophus regius* he considers that the *Eurylaiminæ* and *Muscicapinæ* are united. Of these genera we select

Eurylaimus.

Generic Character.—Bill broader than the head; under mandible very thin, particularly at the base. Nostrils basal, transverse, oval; the aperture naked. First quill slightly, second almost imperceptibly graduated. Tail short, rounded.



*a, bill of Eurylaimus Javanicus seen in profile; b, seen from above; c, anterior toes of the same, to show their relative connexion. (Horsfield.)

Example, *Eurylaimus Javanicus* (*Eurylaimus Horsfieldii*, Temm.).

Description.—Entire length eight inches. Head, sides of the neck, and the whole of the neck and body underneath violet, or rather vinous, varying in intensity. The part of the forehead around the bill nearly black. Upper part of the neck brown, darker towards the back, where the tint is sooty. Wings very deep blackish-brown above, more intense near the shoulder, and lighter towards the extremity. A yellow streak between the coverts and secondary quills. Wings beneath from the axillæ to the shoulder yellow, which borders the wing externally. Tail-coverts black at the base and yellow at the tips, so that the rump appears yellow, which is the colour at the vent. Two intermediate tail-feathers black, four next on each side black, with a white transverse band near the extremity. On the two external feathers the band is near the middle, and rather broader. Bill reddish-brown at the base, with both mandibles irregularly variegated, and striped towards the extremity; culmen yellowish; cutting-edges intensely black and shining. Tarsi and toes dusky yellowish; claws brown, inclining to black.

Geographical Distribution and Habits.—Dr. Horsfield is of opinion that from the observations of Sir Stamford

Raffles in the catalogue of a zoological collection made in the island of Sumatra under his direction, and communicated to the Linnean Society, we can also in some measure determine the range of this genus: 'It extends,' continues the Doctor, 'from Sumatra eastward to Singapura, and thence south to the eastern extremity of Java near the Straits of Baly, where I discovered it in the year 1806; since that period I have not met with it again. We are indebted to Sir Stamford Raffles for the following remarks on the first species:—'It frequents the banks of rivers and lakes, feeding on insects and worms. It builds its nest pendent from the branch of a tree or bush which overhangs the water.' I found it in Java, in one of the most distant and inaccessible parts covered with extensive forests and abounding with rivers and marshes.'



Eurylaimus Javanicus.

Dr. Horsfield placed the genus among the *Meropidæ* or *Syndactylæ*.

MU'SCIDÆ, a family of Dipterous insects of the subsection Athericera. The insects of this family were for the most part included in the genus *Musca* by the older authors, and *Muscidæ* may be regarded as the typical group of the second great division of two-winged flies (the *Brachocera*), in which the antennæ are short and composed of only three joints, and the joints of the palpi are reduced to one or two.

In the most recent work on Dipterous insects* the section Brachocera is divided into three groups:—first, the *Hexachætes*, in which the proboscis is composed of six setæ in the females; the palpi are ovate and elevated in the males, conical and decumbent in the females, and adhering to the base of the setæ; the third joint of the antennæ curved.

The second subdivision, *Tetrachætes*, is thus characterised:—proboscis composed of four setæ; palpi generally adhering to the base of the setæ; third joint of the antennæ either curved or simple, with the stylet usually terminal; wings generally with four or five posterior cells.

In the third subdivision, *Dichætes*, the proboscis has only two setæ, the palpi are generally placed on the base of the proboscis, and the stylet is situated on the upper surface of the third joint of the antennæ: the wings have usually but one submarginal cell; three posterior cells; the anal cell is usually short, and there are sometimes no transverse cells.

The subsection *Athericera*, which forms one of the subdivisions of the great group *Dichætes*, is distinguished by the sucker being enclosed in the proboscis; the antennæ having the last joint usually patelliform. In the *Muscidæ* the proboscis is always very distinct and susceptible of being entirely retracted within the oral cavity; the sucker is composed of two pieces; the stylet of the antennæ is usually plumose to the apex; the body is short and tolerably broad; the eyes, in the male sex, are usually contiguous.

The genus *Musca*, as now restricted, contains such species as have the third joint of the antennæ twice or three times as large as the second; the first posterior cellule of the wings extends to the margin.

The common house-fly (*Musca domestica* of authors) affords a familiar example of this genus, and is too well known to require description. The larvæ, called maggots, live in putrid substances.

MUSCLE is an animal tissue composed of bundles of soft and usually reddish fibres, endowed with a peculiar power of contracting.

The muscles are divided into two classes; the voluntary and the involuntary. The former class, those over which the will exercises a direct control, are subservient to all the actions by which the animal is placed in active relation with the external world, as in all the motions of the limbs, of speech, of the eyes, ears, &c., and they are therefore often called the muscles of animal life; the latter class, comprehending those whose actions are connected with the internal and nutritive functions of the body, over which the will has no immediate or constant control, form the muscular system of organic life, as the heart, the muscular coat of the stomach, &c.

Each voluntary muscle is composed of a number of parallel or nearly parallel fleshy bundles, enclosed in coverings of cellular tissue, by which each is connected with and at the same time isolated from those adjacent to it. Each bundle is again divided into smaller fasciculi similarly ensheathed, and so on through an uncertain number of gradations till one arrives at the muscular fibre, the only definite and fixed form in the system, and the only part which possesses characters common to the muscles of all classes of animals The muscles being thus divided, each fibre or each fasciculus may be regarded as a separate contractile organ, which though usually acting in concert with those adjacent to it, is capable of independent contraction; and the power of a whole muscle will thus be equal to the sum of the powers of its separate fibres, and will bear a direct proportion to their number.

The voluntary muscular fibre is of a cylindrical or prismatic form; its diameter (taking the average of the results of several observations) is $\frac{1}{400}$ of an inch, and it varies in length in different muscles. Each fibre is enclosed in a sheath of extremely delicate cellular tissue, and is marked externally by transverse striæ, by which it is at once distinguished from the fibre peculiar to any other tissue.

The muscular fibre is hollow, and contains a small quantity of glutinous fluid and numerous very minute filaments. These filaments are delicate cylindrical threads, about $\frac{1}{7000}$ of an inch in diameter, and about 100 of them are arranged parallel to each other within the fibre.

In the involuntary muscles the fibres and fasciculi are not arranged in parallel lines, but form varied interlacements, crossing and appearing to anastomose with each other, so as to present only a trace of the general direction in which they act. The fasciculi are connected by less cellular tissue than those of the voluntary muscles. They are generally of a paler colour, and the fibres are not marked by transverse striæ, except those of the heart, on which they are faintly visible.

All the muscles receive large arteries and veins from the trunks passing near to them, whose branches run in the cellular interspaces between the fasciculi, and form at last an irregular network among the fibres. They receive also a large supply of nerves, probably more than any other organs in the body. Nearly one-half of the brain and spinal chord is for the supply of nerves through which the will may act upon the voluntary muscles, or through which their motions may be excited by other stimuli. The involuntary muscles are chiefly supplied from the ganglionic or sympathetic system of nerves. [NERVE.]

Chemically, the muscles are composed chiefly of fibrine. Those of animals, which form a large portion of our food, have been carefully analyzed by Berzelius and many others, who have found that the muscular tissue generally contains about 77 per cent. of water, the rest being composed of fleshy fibre or fibrine, a small quantity of fat and gelatine, albumen, and colouring matter, and a number of peculiar extracts, of which the chief are osmazome, on which the odour of meats depends, and zomidine, from which they acquire their peculiar flavour. The nutritive qualities of meat are, *cæteris paribus*, in direct proportion to the quantity of fibrine which it contains; and this may generally be judged of by the strength and ruddiness of the fibres: hence the more nutritious quality of the muscles of adult than of young animals, and

* 'Histoire Naturelle des Insectes—Diptères,' par M. Macquart, in the 'Suites à Buffon.'

of those parts of animals which are most exercised; though for cooking it is necessary to avoid the toughness of fibre which usually coincides with great strength and a large quantity of fibrine.

The colour of the muscles is dependent partly on the blood which they contain, but chiefly on a peculiar colouring matter, very similar to that of the blood, which is fixed in their tissue. Their colour is distinctly though remotely connected with the quantity and condition of red blood in the system, and its depth is one of the best signs of robustness and full health. Thus in all quadrupeds and birds the muscles are more or less red, and the colour is deepest in the parts which are most actively employed, but pale and scarcely perceptible in those which have not been frequently exerted, and also in those animals which, by being closely stalled and stabled, are killed in a condition of great debility; hence the difference between red and white meats. In amphibia, which have less red blood than mammalia and birds, the muscles are usually pale: in fish, which have still less, they are, with the exception of the heart, and those which move the fins and are particularly exerted, quite white. There are however some exceptions, as the salmon and tunny. In animals of a still lower order, the muscles, though still preserving the same structure, are all quite white.

The peculiar vital power of the muscular tissue is its contractility; that is, the power which its fibres possess, when stimulated by the will or other means, of shortening themselves, and thus approximating the points to which their extremities are attached. When muscles contract, they become shorter, harder, and thicker, but their actual size remains the same, for what they lose in length they exactly gain in breadth and thickness. The fasciculi are also wrinkled or thrown into undulated lines, which are most visible when the contraction is least powerful and rather trembling, and the fibres vibrate so as to produce a distinct sound. The more powerful the contraction, the more rapid are the vibrations of the muscular fibres, the higher the note which they produce, and the greater the difficulty of perceiving them with the eye. The simplest method of observing the sound of muscular contraction is that which Dr. Wollaston pointed out ('Croonian Lecture,' 1809); when the tip of the thumb or of one of the fingers is put into the external ear, while some of the muscles of the former are in a state of contraction, a sound is heard like that of carriages running rapidly over a distant stone pavement. This sound is not heard when the same degree of pressure is applied to the same part by any other means than those in which muscular contraction is concerned. By rubbing a piece of stick over the notched edge of a board so as to produce a similar sound, and counting the number of notches whose edges were struck in a given time, Dr. Wollaston concluded that the number of vibrations of a contracted muscle is between twenty and thirty in a second. The sound thus produced has acquired great importance from its application in auscultation. It is the cause of the first sound of the heart [Heart], and as some modification in its tone and intensity must be produced by the morbid changes to which that organ is subject, it affords one of the indications for the diagnosis of its diseases.

The relaxation of a muscle presents phenomena exactly the converse of those of its contraction. The power by which the voluntary muscles are lengthened after having contracted is generally the extension to which, when they cease to act, they are subjected by some other muscles (their antagonists), whose action is the opposite of their own. The hollow involuntary muscles are usually extended after contraction by the accumulation of fluids or other substances forced into their cavities by some external power. It may be yet a question whether muscles have a vital and independent power of dilatation as well as of contraction, but on the whole the evidence is in favour of their possessing such a power, for the heart will contract and dilate when empty, if external stimuli are applied, and the hearts of reptiles when hung in the air will sometimes go on contracting and dilating till they are nearly dry and stiff. Were there no vital power of dilatation, it is difficult to conceive how the heart or any other muscle when separated from the body should, after having once contracted, be dilated so as to be able to contract again.

When muscles shorten however it is not always by an exercise of their peculiar vital contractility, but often by their elasticity, by which, like all the other tissues, they are always maintained in a certain degree of tension. Thus when a muscle is divided, its ends retract as well after death, or when its nerves are cut, as during life and health. It is by this power that muscles, after having been much extended, generally return to their natural size; thus when a muscle on one side of the joint of any limb shortens, it is evident that its antagonist on the opposite side must be lengthened in the same proportion, and when the contracting muscle ceases to act, the elasticity of the extended one (increased by the tension to which it has been subjected) will be alone sufficient in most cases to restore the limb to its position of rest.

The actual power with which a muscle contracts is in direct proportion to the number of its fibres and inversely as their length. Hence in all the muscles in which great strength is required, as in the chief muscles of the shoulder and hip, the fibres do not run straight from the general point of origin to that of insertion, but the whole mass of the muscle is divided into a number of small portions, in which a multitude of short fibres are attached to separate points within the muscle, so that they may act separately, or, when great exertion is necessary, altogether, and with far greater power than a smaller number of long straight fibres could. The strength of a muscle is very commonly increased by its fibres not running parallel to the line in which the muscle has to draw the part to which it is attached, but with various degrees of obliquity to that line. Thus in many muscles the fibres and fasciculi are attached obliquely to one or both sides of a tendon, as the fibres of a feather are attached to its shaft; by which arrangement, though each muscular fibre contracts in its own direction, the general result of their contraction and the direction in which the resistance will act upon them forms an oblique angle with their direction and much of the danger of their being ruptured is removed. There are indeed but few instances of rectilineal muscles in the body; in nearly all, the fibres are placed more or less obliquely to the line in which they have to draw the part to which they are attached; a plan by which, though individually they lose in active power, they gain in resistance, and by which a far greater number may in the the same space be brought to bear upon a given point.

An almost infinite variety of arrangement is found in the muscular fibres adapted to the especial purpose which each muscle has to fulfil, whether it be chiefly strength of action, or rapidity or extent of motion; and all are guided by the nicest mechanical rules. Wherever strength is more necessary than a wide extent of motion, the fibres are increased in number and placed obliquely to the direction of the resistance; wherever extent of motion is more needed than strength, the fibres are long and run almost straight from one point to the other, so as to give the full benefit of their contraction; where velocity is required, they are placed at a part of a lever close by the centre of motion, the resistance being placed on a part more distant from the centre. In general the absolute power exerted by a muscle in contracting is much less than its efficient power, a great part of its force being lost in its being inserted obliquely on the lever which it has to move, or in the distance of the resistance from the centre of motion, or in the resistance which other muscles and the adjacent tissues, which have to be extended, present, &c. But it is constantly found that where power is lost, a corresponding gain of velocity or extent of motion, or of convenience and compactness of form, and readiness of action, is obtained.

MUSCLE, or MUSSEL. [Mytilidæ.]

MUSES (*Musæ*, in Latin; Μοῦσαι, in Greek), the name of certain sister goddesses in the Greek mythology, who were supposed to preside over the arts of poetry and music, and the sciences of history and astronomy. The original conception of the Muses must be sought for in that disposition of the human mind which prompts us to embody abstract ideas in a sensuous form. Such seems likewise to have been the origin of the Graces, Fates, Furies, and other mythological personages of that class. [Graces.] In the instance of the Muses, the powers of memory, music, and song were personified into individual goddesses, who were supposed to inspire men with these gifts. At first the Muses were said to be only three: Mneme, that is, 'memory;' Melete, or 'meditation;' and Aoide, or 'song;' and they resided of old on Mount Helicon in Bœotia. (Pausanias, ix. 29.) According to the poet Alcman, they were the daughters of Uranus and Gæa, or the earth. Cicero (*De Natura Deorum*, iii. 21) mentions four, namely, Thelxinoe, 'mind-soother; Arche, or 'beginning;' Aoide; and Melete; and he says that they were the offspring of the second Jupiter. [Jupi-

TER.] He goes on to say that there were other Muses, nine in number, born of the third Jupiter (the son of Saturn) and of Mnemosyne; and also a third family of Muses, called Pierides by the poets, who were the daughters of the third Jupiter and Antiope, and were similar in their names and equal in number to the preceding. Hesiod, in his 'Theogony' (53), reckons nine Muses, daughters of Zeus and Mnemosyne, and gives their names as follows:—Calliope, Clio, Melpomene, Thalia, Euterpe, Terpsichore, Erato, Polyhymnia, and Urania, and he says that Pieria in Macedonia was their first dwelling-place. These are the Muses generally alluded to by the poets. It appears that the worship of the Muses was introduced from Macedonia into Bœotia, Phocis, and other parts of Hellas. The story of the contest of the Muses with the nine daughters of Pierus, a Macedonian, who pretended to rival the Muses in singing, but were vanquished and changed into magpies (Ovidius, *Metamorph.*, v.) may have been, as some critics have conjectured, an allegory originating in the national vanity of the Greeks, to show their superiority in the arts and sciences over their Macedonian neighbours. The Thracian bard Thamyris tried a like chance, with a like result: he had his eyes put out and was deprived of his lyre.

Homer mentions the Muses as the goddesses of song, who inhabited lofty Olympus, but he does not specify their number or names. In the second book of the Iliad he invokes them, 'to whom all things are known,' to assist his memory while he is enumerating the leaders of the Greek forces at Troy. The occupations of the Muses were singing, dancing, and attending the banquets of the Gods. They were the attendants of Apollo and also of Bacchus. The name Musa is supposed by some to be derived from a Greek verb which means 'to discover,' because the Muses were said to be acquainted with recondite mysteries and future events; but this etymology is mere trifling, and the origin of the name is unknown. They were represented as handsome and modest virgins, dressed in long tunics, with wreaths of laurel, ivy, or palm leaves on their heads. It was only in later ages that peculiar attributes were given to each of them by the artists, and a peculiar department of science was assigned to each by the poets. In several paintings of Herculaneum they are represented with their respective attributes, and with their respective names written under each. By comparing these with several rilievos, medals, and mosaics, their identity becomes confirmed. (Millin, *Galérie Mythologique*, plates 19 to 23, and explanation thereof.) The following is a list of them, with the allegorical meaning of their names:—

Clio, from *cleio*, 'to celebrate glorious deeds,' is represented with a scroll in her hand, and also sometimes with a 'scrinium' to keep MSS. in, by her side. She has been styled the Muse of History.

Calliope, 'fine voice,' is represented with tablets and a style; sometimes with a trumpet in her hand; in some instances, as at Herculaneum, with a scroll like Clio. She was the Epic Muse.

Melpomene, 'the singer,' wears a royal diadem round her head, and a wreath of vine leaves, with cothurni on her feet; a mask in one hand, and a club in the other. She was the Muse of Tragedy.

Thalia, 'the joyous,' the Muse of Comedy, is also crowned with vine leaves, has a crook in one hand and a grotesque mask in the other.

Euterpe, 'the pleasing,' carries a double flute. She presided over music.

Terpsichore, 'dance-loving,' carried a lyre, and presided over lyric poetry and dance.

Erato, 'the lovely,' carries also a lyre. She was the Muse of elegy and amatory song.

Polyhymnia, 'of many songs,' is represented wrapped up in her cloak, and buried in meditation, with the fore-finger of her right hand across her mouth, in token of reserve and caution. She was the Muse of religious song, allegories, and mythical strains.

Urania, 'the heavenly,' has the globe and compasses in her hands, which are the emblems of her calling, astronomy.

The corruption which, in the course of ages, pervaded mythological symbols, did not spare the Muses, and accordingly we find their chastity denied by several writers. According to Apollodorus, Ovid, and others, Clio had Orpheus by Apollo, Euterpe had Rhœsus by the Strymon, Calliope was the mother of the Sirens by Achelous, &c.

The favourite haunts of the Muses were, Mount Parnassus in Phocis, Helicon in Bœotia, Pierius, Pindus, and Olympus, in Thessaly, &c. The swan, the nightingale, and the grasshopper were sacred to them. The Roman poets called the Muses Camenæ, an Etruscan name—for it appears that the Etruscans had also their Muses (Micali)—and also Pierides.

(Creuzer, *Symbolik und Mythologie*; Petersen, *De Musarum Origine*, in Münter's *Miscellanea Hafniensia*; Hermannus, *De Musis fluvialibus*; Millin, *Galérie Mythologique*; Keightley's *Mythology of Antient Greece and Italy*.)

MUSE'UM, a place dedicated to the Muses, from the Greek *Mouseion* (Μουσεῖον); hence any place where learning is pursued, or which is set apart as a repository for things that have some immediate relation to the arts, is so termed. The earliest institution we are acquainted with which received this appellation was the museum founded at Alexandria by Ptolemy Philadelphus. The buildings of this institution were afterwards enlarged by the emperor Claudius. (Suet., *Claud.*, 42.)

MUSGRAVE, WILLIAM, born in 1657, in the county of Somerset, studied at Oxford, where he took his degree of M.D. In 1684 he became secretary to the Royal Society of London. In 1691 he fixed his residence at Exeter, where he practised as a physician, and where he died in 1721. Dr. Musgrave was a good scholar, and well versed in antiquity. He published—1, 'Geta Britannicus,' being the life of Geta by Capitolinus, with notes, to which he added a dissertation by way of commentary. 2, 'Julii Vitalis Epitaphium, cum Notis Criticis H. Dodwelli, et Commentario Guil. Musgrave.' This is a commentary on a Roman epitaph found near Bath. 3, 'De Aquilis Romanis Epistola.' 4, 'De Legionibus Epistola.' 5, 'Belgium Britannicum, in quo illius Limites, Fluvii, Urbes, Viæ Militares, Populus, Lingua, Dei, Monumenta, aliaque permulta clarius et uberius exponuntur,' 8vo., 1719. He wrote also several medical works.

MUSGRAVE, SAMUEL, M.D., the grandson of the above, also practised as a physician in Exeter, and died there in 1782. Besides a few works on medical subjects, he was the author of 'Exercitationes in Euripidem,' 8vo., Leyden, 1762; 'Animadversiones in Sophoclem,' 3 vols. 8vo., Oxford, 1800; and 'Two Dissertations—1, On the Mythology of the Greeks; 2, An Examination of Sir Isaac Newton's Objections to the Chronology of the Olympiads.' He also assisted in the edition of Euripides, 4 vols. 8vo., Oxford, 1778. Schweighaüser, in his edition of Appian, has cited many of Musgrave's emendations and conjectures on that author from the marginal notes in Musgrave's copy of Appian. Schweighaüser justly calls him a good Greek scholar and an acute critic.

MUSHROOM. The species of mushroom usually cultivated is the *Agaricus campestris*. In the order of fungi, which includes that plant, most species are poisonous, and fatal consequences have resulted from ignorance of the characters by which the wholesome mushroom is distinguished from such allied species as are liable to be mistaken for it. These characters have been already pointed out. [AGARICUS.] What remains to be noticed relates to cultivation.

Mushrooms are indigenous; they spring up abundantly in fields where cattle have been pastured, if the soil and temperature prove favourable for the development of the *spawn*, a term which is applied to the substance in which the reproductive principle is embodied, which presents to the naked eye the appearance of whitish mouldiness, and which is in reality the flocculent subterranean stem, while the mushroom itself is the fruit. In this state spawn may be kept for years if moisture be withheld; but if the latter be supplied, in conjunction with a proper degree of temperature, it is further developed into white filaments and tubercles, which ultimately rise above the soil in the form of mushrooms. These spring up sometimes singly, but frequently in a gregarious manner.

Mushrooms appear in the fields chiefly after Midsummer, in the months of July, August, and most abundantly in September. On a ten years' average the temperature of these months respectively in the neighbourhood of London has been found to be 64°, 62°, and 57°; and in the same periods the temperature of the earth one foot below the surface is a few degrees higher; but at the depth of two or three inches, where the vegetating spawn is situated, the temperature in hot sunny weather is frequently as high as 80°. Whilst such hot weather continues, mushrooms are

rarely met with; but when the atmosphere changes to a humid state, and when the earth becomes sufficiently moistened and lowered in temperature, in consequence of rain and absence of sun-heat, to between 60° and 65°, mushrooms become plentiful. Hence it may be concluded that spawn will not be injured by a heat of 80° during what may be termed its underground state of progression. This is corroborated by the fact that spawn introduced into melon-frames when the beds are moulded, increases whilst the melons are grown in a heat of about 80°, and when the melon crop is over, the frame cleared, and the heat of the bed naturally abated, a gentle watering, with shade, is all that is necessary to bring up an excellent crop of mushrooms from the spawn so deposited. It is evident from what has been stated that the spawn requires a high temperature for its diffusion; but when this has taken place a declining temperature is requisite, till gradually the bottom heat is lowered to 60° or 65°, and the temperature of the air limited between 55° and 65°, when the production first appears above the soil.

With regard to moisture it may be observed that a dry atmosphere is injurious, not only to artificial crops, but also to those in the fields; for the latter warm foggy mornings are most favourable, and these should be imitated as closely in cultivation as circumstances will permit. A gentle steam is more easily maintained in mushroom-houses than in structures adapted for other subjects of cultivation where light is an object of importance; but mushrooms do not require its agency, and consequently a glass roof is unnecessary: on the contrary, the roof and walls where they are intended to be grown should be composed of such substances as will cause the least possible condensation of the internal vapour, and which are in other respects eligible for the purpose.

A thatched roof of a good thickness is very proper; a slated or tiled one is on the contrary objectionable unless a ceiling be formed under it. If the cavity between the ceiling and the external covering were filled with dry moss, a more complete protection would be formed against any sudden vicissitudes of cold and heat, an object of importance towards success either in the cold winter months or during the greatest heat of summer.

The materials of which beds for the growth of mushrooms are composed usually contain spawn; but as they may or may not happen to do so, it is necessary to be provided with some, in order that it may be introduced when the beds are in the best state for accelerating its development. Spawn may be purchased; or a small quantity having been procured about old melon-beds, horse-tracks under cover, dry places where cattle usually take shelter, or elsewhere, it may be propagated by incorporating to the consistency of mortar a quantity of horse-droppings, cow-dung, and loam; and if the last be taken from places where mushrooms have been grown, so much the better. This composition, or in fact any one of a similar kind that may be equally adapted for a matrix wherein the spawn may extend itself, should be spread to the depth of three inches, and afterwards cut into cakes, or formed into small flat bricks with one or two holes in each, into which portions of the previously collected spawn are inserted. The bricks should be in a firm state when the spawn is introduced, but not dry. The whole should then be formed into a pile, not too compact, some spawny soil being sprinkled as the strata are being deposited, if such can be readily obtained, and a covering of hot dung applied. In a short time the spawn becomes diffused throughout the mass; and whenever this is found to be the case, the bricks must be uncovered and allowed to dry, for the purpose of arresting the progress of vegetation in the spawn till it is required for use.

Various compositions have been successfully employed in the formation of mushroom-beds. Horse-dung, chiefly fresh droppings, or with only some of the shortest litter intermixed, is however principally esteemed; and such should be collected when the horses are not on green food, but are being fed on corn, or on corn and hay. If the beds are intended to be formed of considerable thickness, which some prefer because they continue longer in a bearing state, then it is proper that the fresh dung should be mixed with some old hot-bed materials, or with light loam, in such proportion as will prevent a too violent fermentation. In all cases the composition should only possess sufficient moisture to induce fermentation. It may then be compactly deposited in any dark situation where the temperature and moderate moisture of the atmosphere can be rendered congenial, either in boxes that are moveable or in such as are fixed on purpose along the walls of a shed or mushroom-house, the construction of which may be that of any convenient form, provided its adaptation to the principles here mentioned be kept in view. The bed should not however be in immediate contact with the ground, unless under circumstances which may occasion the latter to possess a temperature of between 60° and 65°.

It is desirable that the materials should not ferment higher than 80°; when slowly on the decline from this temperature, the spawn should be introduced by inserting small pieces merely within the surface of the bed, through which it will soon become diffused; and whilst this is being effected, a covering of rich loam to the depth of two inches is spread over the bed, which, as well as the whole of the materials, should be rendered very compact.

Extremes of moisture and dryness are alike to be avoided. Waterings, when at all necessary, should be light; and it is particularly essential that the water should be of an equal temperature with the bed. A covering of hay and mats is very useful for preserving uniformity of temperature and moisture in the beds, especially in situations not adapted for having the regulation of these conditions fully at command.

As wooden shelves or boxes are soon rotted by the dung, brick arches have been in some cases substituted; but these occupy much space. Slate would be a better material, since it can be had of ample dimensions and of sufficient strength. The shelves may be of any convenient width; but in order to contain a sufficient depth of materials for producing the requisite degree of fermentation, the front ledge ought to be at least eight inches deep.

Objections have been made to the use of slate on account of its not absorbing moisture, whilst at the same time it occasions condensation. Moisture may indeed be observed to be very copiously deposited on slate, but this only takes place when the temperature of the slate is lower than that of the air in contact with it. Therefore in a mushroom-house properly regulated no condensation would take place, for as the materials of the beds are at least always as warm as the atmosphere of the house, and in generally more so, the slates in contact must be equally warm, and consequently not liable to the above objection.

MUSIC (*Musique*, Fr.; *Musica*, Lat.; Μουσική, Gr., from μοῦσα, a *muse* or *song*) is the artistic union of inarticulate sounds and rhythm, exciting agreeable sensations, and raising mental images and emotions directly or indirectly pleasing. Such is pure unmixed music. When conjoined to poetry, it is an art not of diminished importance, but of a dependent nature, its office then being to enforce the meaning of the words and add a colouring to them. As an adjunct it is a beautiful illustration of language; combined with the sister art, it becomes a highly ornamented kind of eloquence. Hence it will be seen that we widely differ from one who has been looked up to as an unquestionable authority, from the celebrated Rousseau, whose well-known definition of music—'l'art de combiner des sons d'une manière agréable à l'oreille' (*the art of combining sounds in a manner agreeable to the ear*)—has been so generally received, and even adopted by those whose capacities and knowledge might have enabled them to take a much more enlarged view of the subject. One very learned Frenchman however has repudiated the degrading description given by his distinguished countryman: M. Villoteau stamps it with the epithets insignificant and vulgar, considering it absurd and puerile; for with as much propriety might oratory be be described as *the art of combining words in a manner agreeable to the ear*, or painting as *the art of combining colours in a manner agreeable to the eye*.

Music is a kind of language, and as such, says Metastasio, it possesses that advantage over poetry which a universal language has over a particular one; for this last speaks only to its own age and country; the other speaks to all ages and countries. James Harris, in his philosophical *Discourse on Music, Painting, and Poetry*, expresses the same opinion, even going to the length of asserting, that while a description in words has rarely any relation to the several ideas of which those words are the symbols, 'musical imitations are intelligible to all men.' Music is a language that speaks by imitating, and as such it is understood by those who have successfully studied the art, and likewise by mere amateurs, who, with little if any knowledge of its principles, have learnt the meaning of its expressions by long practice, by frequently hearing and enjoy-

ing its performance; but it can only express passion and sentiment very generally, and commonly fails when it attempts to particularise. This want of absolute decision in what is called musical language is by some writers reckoned among its advantages, because it gives the hearer great latitude in interpreting it, which he usually does in a manner as congenial as possible to his own feelings at the time. Madame de Staël goes so far as to prefer instrumental to vocal music, on account of the *vagueness* which she thinks one of the attributes of the former—that very same vagueness which Fontenelle meant to impute to it as an egregious fault, when, in a transport of impatience, he exclaimed, '*Sonate, que me veux tu?*' Burke's opinion however coincides with Madame de Staël's, if it did not actually prompt it. He says, 'the passions may be considerably operated upon, without presenting any image at all, by certain sounds adapted to that purpose, of which we have a sufficient proof in the acknowledged and powerful effects of instrumental music.' He however soon afterwards adds, that 'in reality a great clearness helps but little towards affecting the passions, as it is in some sort an enemy to all enthusiasm whatever.' This is rather startling as a general proposition: if we admit it as applied to vocal music, we must, *à fortiori*, allow that the finest compositions of that kind, which certainly leave nothing to the imagination of the hearer, exercise little if any influence over the passions. But being decidedly opposed to such an opinion, we must condemn it, though advanced by the eminent writer of the *Enquiry concerning the Sublime and Beautiful*, and supported by the distinguished author of *Allemagne*. No one has written in a more enthusiastic strain on the power of music in imitating than Rousseau. The reader of the article 'Imitation,' in his Dictionary, will find little difficulty in believing all that is said of Orpheus and Amphion, if he suffers himself to be convinced by the florid, declamatory, extravagant passage to which we allude. The writer of the first *Bridgewater Treatise*, Dr. Chalmers, has argued no less earnestly in favour of that musical language of which we are speaking. 'Music,' he says, 'apart from words, is powerfully fitted both to represent and awaken the mental processes, insomuch that, without the aid of spoken characters, many a story of deepest interest is most impressively told, many a noble or tender sentiment is most emphatically conveyed by it. . . . . . The power and expressiveness of music may well be regarded as a most beauteous adaptation of external nature to the moral constitution of man. . . . . . Its sweetest sounds are those of kind affection: its sublimest sounds are those most expressive of moral heroism, or most fitted to prompt the aspirations and resolves of exalted piety.' Fontenelle, on one side, and Rousseau, with Dr. Chalmers, on the other, are at the two extremes on this question: the one, from a deficiency of musical feeling, granting too little; the others, from an excess of it, admitting too much.

A musical sound,—which is a curious compound of other sounds, called harmonics, resulting from a number of vibrations in equal times,—when produced by a fine voice, a rich-toned violoncello, or a 'mellow horn,' excites in all who possess a moderate share of nervous sensibility, a pleasurable sensation; and this, Sir John Herschel observes, 'is perhaps the only instance of a sensation for whose pleasing impression a distinct and intelligible reason can be assigned.'

Dr. Beattie does not think it absurd to suppose that the body may be mechanically affected by sound. 'If,' he says, 'in a church one feels the floor and the pew tremble to certain tones of the organ; if one string vibrates of its own accord when another is sounded near it, of equal length, tension, and thickness; if a person speaks loud in the neighbourhood of a harpsichord, and often hears the strings of the instrument murmur in the same tone, we need not wonder that some of the finer fibres of the human frame should be put in a tremulous motion when they happen to be in unison with any notes proceeding from external objects.' Most persons must have witnessed the effect of a street-organ on some of the canine species, apparently willing auditors, who, if not driven away, continue to howl all the while the instrument is playing. Whether they are painfully affected, and their tones those of distress, or agreeably, and they become responsive, does not appear; though if distressed, the probability is that they would fly from the cause. But Dr. Mead tells us that a celebrated violinist of his acquaintance, perceiving that his dog betrayed symptoms of great suffering on hearing a certain passage performed, repeated it for some time, in order to try the result, and the experiment proved fatal to the poor animal, who 'dropped down at the feet of his master, where in a few seconds he died in the most horrid convulsions.' The surprising and hitherto unexplained connection between form and vibrations producing musical sounds, so beautifully shown in Chladni's experiments on plates of glass strewed with sand, and put into sonorous vibration, thereby throwing the sand into various symmetrical figures, may be here incidentally mentioned, though it does not now seem to shed any new light on the subject before us; nevertheless by proving something like sympathy, and of a much more extraordinary kind than that between two strings, in mere matter, it may at a future period lead to interesting discoveries.

The effect of Rhythm, or measure, is universally felt and admitted: the most polished inhabitants of Europe, and the most barbarous natives of the arctic regions, are alive to its influence; it is that which reduces unmeaning sounds to order, converts them into melody, and bestows on them proportion and a power to charm. The chirping, or whistling, or singing as it is called, of most birds, being devoid of rhythm, affords no pleasure but what is derived from association; while the single note of a drum beaten in time, combining sound and measure, is gratifying in a certain degree to every hearer. Indeed, with the antients rhythm was of paramount importance, if not almost everything, in what they denominated music, a term under which was included much that it does not imply in modern language. Aristides Quintilianus, the best of the seven Greek writers on music collected by Meibomius, remarks that rhythm is the object of three senses, namely, the sight, as in dancing; the hearing, as in music; and the touch, as in the pulsations of the arteries.

Much of the effect of music on the mind is ascribed to Imitation, which is either direct or indirect. And it must be understood that we are still speaking of music strictly instrumental, not vocal. The power of direct imitation is confined within very narrow limits indeed, though composers have often attempted to enlarge the boundaries, exposing their own weakness and that of their art. The song of some birds, the whistling of winds, the roaring of the tempest, the sound of cannon, the ringing and tolling of bells, and perhaps the tones of the human voice expressive of certain emotions, are legitimate objects of direct imitation; but the rattling of hail, the fall of snow, the motions of animals, actions at sea, battles on land, &c., are not only unrepresentable by any kind of musical instrument at present known, but unfit for imitation if instruments could be constructed for the express purpose. Greatly we admire the introduction to the oratorio of *The Creation*, considered as a most original and ingenious composition, but cannot bring ourselves to believe that any idea of *chaos* is to be excited by exquisite harmony. Still less can we be convinced that *silence* can be imitated by sound, though the author of this musical solecism (which appears in a symphony intended to be descriptive) is a man of rare talent, whose works are highly esteemed in England, and still more so where better known, in Germany, his native country. Music can imitate in a direct manner only by its actual resemblance to the sound of the thing imitated. Of all the powers of music, in the opinion of an admirable critic, the Rev. Thos. Twining, that of raising ideas by direct resemblance is the weakest and least important. 'It is indeed so far from being essential to the pleasure of the art, that unless used with great caution, judgment, and delicacy, it will destroy the pleasure by becoming offensive or ridiculous. The highest power of music, and that from which it derives its greatest efficacy, is undoubtedly its power of raising emotions.'

Professor Hutcheson, in the early part of the last century, expressed nearly the same opinion. What he adds concerning the imitation of the human voice and accents is entitled to particular attention. He says, 'There is a charm in music to various persons which is distinct from the harmony occasioned by its raising agreeable passions. The human voice is obviously varied by all the stronger passions: now, when our ear discerns any resemblance between the air of a tune, whether sung or played on an instrument, either in its time or modulation, or any other circumstance, and the sound of the human voice in any passion, we shall be touched by it in a very sensible manner, and have melancholy, joy, gravity, thoughtfulness, excited in us by a sort

of sympathy or contagion.' (*Enquiry into our Ideas of Beauty, &c.*)

Plato, in the third book of his 'Republic,' speaks of a warlike air inspiring courage, because imitating the sounds and accents of the courageous man; and of a calm and sedate air producing tranquillity and gravity, on the same principle. This leads us to the consideration of indirect imitation, to which part of our subject it perhaps more properly belongs.

Indirect Imitation is that by which some quality common to music and the thing imitated is indicated by sounds, strong or weak, quick or slow. Rage is loud, anger is harsh, love and pity are gentle; therefore loud and harsh sounds raise ideas of the former passions and others of the same class; soft and tranquil sounds raise ideas of the latter and others of a similar character. Hence it will be seen, as before observed, that the hearer may interpret music in a manner corresponding in some degree to the state of mind in which it shall find him, but under certain restrictions from which he cannot be released. If agitated by any turbulent passion, he will find it impossible to convert smooth and delicate music into a language in unison with his irritated feelings; and if under the softening influence of some tender attachment, or of sorrow for the loss of one beloved or valued, he will be unable to construe bold and brilliant sounds as expressions of sympathy. But music that is not of a decided character will prove more or less convertible. And it is to this latter kind probably that Mr. Twining alludes, when, speaking of good instrumental music 'expressively' performed, he says, 'the very indecision of the expression, leaving the hearer to the free operation of his emotion upon his fancy, and, as it were, to the free choice of such ideas as are to him most adapted to react upon and heighten the emotion which occasioned them, produces a pleasure which nobody, I believe, who is able to feel it will deny to be one of the most delicious that music is capable of affording.' (*Dissertation on the word Imitative, &c.*)

It is proper to add that this very learned and able commentator on Aristotle considers the word *imitative* inapplicable to music, and proposes instead of it the term *suggestive*. This is perhaps an amendment in the case of what we have called 'indirect imitation;' but *direct imitation* does more than *suggest* the idea; it may be said, without any violent distortion of language, to represent it.

Association, which has so large a share in the operations of the human mind, often contributes much to the effect of music. Indeed some airs possessing no intrinsic merit owe their influence solely to this principle, and among these the famous *Rans des Vaches*, which, in times happily gone by, acted with such irresistible force on the expatriated Swiss soldier. It was many years after the battle of Culloden, and not till all fears of the Pretender had subsided, that the Scotch bagpipers ventured to play any of the Jacobite tunes, which, when revived, were heard with delight, though hardly one of them would have continued to be listened to but as connected with the history of the country. When Sir Joshua Reynolds was at Venice—we are told by Mr. Malone—'in compliment to the English gentlemen then residing there, the manager of the opera one night ordered the band to play an English ballad-tune. Happening to be the popular air which was played or sung in almost every street, just at the time of their leaving London, by suggesting to them that metropolis with all its connections and endearing circumstances, it immediately brought tears into the artist's eyes, as well as into those of his countrymen who were present.' To compositions of a very ordinary kind, association, Dr. Beattie remarks, gives a significancy. 'We have heard them,' he says, 'performed, some time or other, in an agreeable place perhaps, or by an agreeable person; or have heard them in our early years, a period of life which we seldom look back upon without pleasure. Nor is it necessary that such melodies or harmonies should have much intrinsic merit. . . . . If a song, or piece of music, should call up only a faint remembrance that we were happy the last time we heard it, nothing more would be needful to make us listen to it again with peculiar satisfaction.' To this latter part, however, we can only give our assent generally: painful experience has taught many that there is an exception to the rule. A composition which had been listened to with unalloyed pleasure when executed by one possessing all our tenderest and warmest affection, only excites the idea of lost, of irrecoverable happiness, if heard when death has deprived us of the performer who had imparted to the music its greatest charm. Except in this particular instance, we fully agree with the elegant author of *Essays on Poetry and Music*, in the preceding observations; though Boethius, in his treatise 'De Consolatione Philosophiæ,' and after him Dante, in his *Inferno*—both high authorities—express the opposite opinion, namely, that in distress and adversity the greatest misery is the recollection of former happiness. But the poetical notion of the Hindus regarding musical effect, which they strictly connect with past events, seems to us the finest that ever was conceived;—they say that it arises from our recalling to memory the airs of Páradise, heard in a state of pre-existence.

After all, however, that has been written and said, from the days of Aristotle down to the present period, of music as an imitative art, it must be conceded that modulated sounds please, by some mysterious means, many to whom they present no imitation of anything material or immaterial, and who associate with them no other idea than that of melody or of harmony. These are, probably, the persons whom Rousseau had in view when, mistaking the exception for the rule, it seems to have been his design, in one of his wayward moments, to reduce that which is at once an art and a science, to the low rank of a sensual gratification. But in justice to that eloquent writer, it should be added, that, in his *Essai sur l'Origine des Langues*, he at once demolishes his own definition—which, unfortunately, has been so widely circulated—by the interposition of a simple negative: e.g.—'La musique *n'est pas* l'art de combiner des sons d'une manière agréable à l'oreille.'

Thus far our attention has been directed to instrumental music, or that which is dependent on no auxiliary for effect, on no words to explain its meaning, on no gesticulation or scenery to illustrate it. We have now to consider music as produced by the human voice in alliance with language, whether poetical or prose, and with or without instrumental accompaniment.

Vocal music is entirely devoid of that ambiguity which some think a merit in instrumental music, and some consider a defect. Words fix the intention of musical sounds, leaving nothing for the hearer to conjecture; for though the more or less of truth in the expression will depend on the skill of the composer, yet he must be utterly destitute of reason to give to revenge the tones of love, or to joy those of despair. It is true that he does not always read with discriminating judgment the words selected by him, or committed to his charge—that in emphasis he is sometimes erroneous, and in accentuation frequently faulty; and for these failings in the artist, the art itself has been unjustly condemned by writers whose repute gives weight to their censure. But the heaviest charge brought against composers of vocal music, and that which has exposed them to the keenest ridicule, is their eagerness to express the literal meaning of a particular word rather than the sentiment, the sense of the entire passage. This exceedingly vulgar kind of imitation, which has not unaptly been called *musical punning*, may be traced to a gross misapprehension of the rule, that 'the sound should seem an echo to the sense,' and is the vice not only of composers of an inferior order, but, occasionally, of some of the highest class. The great Handel himself is not wholly exempt from its influence. In the fine chorus, 'Wretched lovers, quit your dream' (in *Acis and Galatea*), when the line 'Hark! how the thund'ring giant *roars*' occurs, he makes the bases roar in a long division, till they nearly gasp for breath. But this is a verb that proves very seductive to composers; in two of our best glees it sets the voice a-roaring through several bars:—in the one, because the poet (Ossian) asks, 'Who comes so dark from ocean's *roar*?' In the other, because the poet (Gray) says, 'The rocks and nodding groves rebellow to the *roar!*' Handel's favorite air, 'What passion cannot music raise and quell?' from Dryden's *Ode to St. Cecilia's Day*, sends the voice tumbling down a full octave at the words 'faces fell.' In the same work the singer is condemned to ascend to a note which few can reach, and none can sustain without lungs of very unusual capacity, merely because the author says, 'The trumpet shall be raised on *high*.' Our greatest English composer, Purcell, could not resist the temptation offered by the words 'They that go *down* to the sea in ships,' from the 107th Psalm, in setting which he commits the base voice to so very low a deep, that there was only one man in his day who could

sing the anthem. 'Some eminent musicians,' Sir William Jones observes, 'have been absurd enough to think of imitating laughter and other noises; but if they had succeeded, they would not have made amends for their want of taste in attempting it; for such ridiculous imitations must necessarily destroy the spirit and dignity of the finest poems.' This discerning and elegant writer most likely points at the song and chorus, 'Haste thee, nymph,' in Handel's setting of Milton's *L'Allegro*, in which is the line, 'And Laughter holding both his sides.' The singers in this, it must be allowed, never baulk the intention of the composer, but affect to laugh almost convulsively. To carry out the design to its utmost extent, they should cast away their books, press their ribs firmly with both hands, and, by adding action to sound, complete the living picture. In another song by Handel, which was once very popular, in the oratorio of *Semele*, is a remarkable instance of a mistaken attempt at imitation. The words are—

> 'The morning lark to mine accords his note,
> And tunes to my distress his warbling throat.'

These lines (foisted into Congreve's poem) are silly enough; but the composer has rendered them perfectly ludicrous, by one of those long-winded *divisions* which were the besetting sin of the age, on the word 'warbling.' In the midst of her distress, Semele and two fiddles—the latter representing the bird—strive who shall best mimic the soaring songster, till the lady is obliged to yield, from pure exhaustion. The mention of the lark has entrapped many a composer; the musical follies committed in his name are innumerable. Handel's song, 'Sweet Bird,' from *Il Penseroso*, always has been, and most likely always will be, admired as music, and it affords an opportunity for the display of talent in the singer and the flute-player, but it cannot stand the test of criticism. The same objection exists to this as to the air just noticed; the divisions are in themselves absurd, but as imitations are still more so. Surely the composer must have been aware that the note of the nightingale is the simplest that is practised by the feathered race, yet he has here given the melancholy bird sounds which, as regards variety, rapidity, and compass, only able performers can produce from a fine voice and a perfect instrument. Handel's supremacy in the art renders him especially liable to animadversion when misled by an erroneous conception of the words; but he has been charged with many supposed imitations which he never contemplated, such as the *whipping-chorus*, the *rocking-chorus*, &c. We have however said as much as is necessary on this part of our subject.

In the accompaniment to vocal music, much greater freedom of imitation is allowable than in the voice part: kept within those bounds which good sense and cultivated taste prescribe, it affords very efficient aid, by giving greater force to the poetry, and contributing to the completion of the general design. It also adds harmony to song, a most important, if not an indispensable support. Nearly all that imitation can do, should—as the elder Dr. Gregory, of Edinburgh, in some admirable remarks on music has observed—be assigned to the accompaniments, as these, on account of the greater compass and variety of instruments, are better adapted to such a purpose than the voice, which ought to be left at liberty to express the sentiments. If Handel has sometimes failed in imitations by the voice, he has often succeeded in those by the accompanying instruments. We need but refer in proof to his beautiful song in *Il Penseroso*—

> 'Oft on a plat of rising ground
> I hear the far-off curfew sound,'—

where he has imitated the bell by the deep-toned strings of the bases, confining the voice to those notes of pleasing, contemplative melancholy, the idea of which the words so completely excite. The same skill and discrimination are shown in the song of Galatea, 'Hush! ye pretty warbling quire,' in which the flute imitates the birds, leaving the singer to express in simple sounds that languishing tenderness indicated by the poetry. Handel was the first who endeavoured to excite the idea of light through the agency of musical sounds: his chorus in the oratorio of *Samson*, 'O first created beam!' was written with this design; and moreover suggested to Haydn that grand composition on the same subject which is admitted to be one of his noblest triumphs. But the still bolder attempt of the former great master was to convey to the mind, through the same medium, a notion of darkness. With this view he composed the sublime chorus in *Israel in Egypt*, beginning, 'He sent a thick darkness over all the land,' the accompaniments to which, assisted by the words, produce on persons susceptible of musical impressions, all that solemnity of effect, not unmixed with awe, intended by the author.

Haydn, though sometimes ambitious of achieving by musical means more than the art can accomplish, was often most happy in indirect imitation by instrumental accompaniments; witness the magnificent burst of sound in the first chorus—to which we have just alluded—in *The Creation*, at the words, 'and there was light.' Witness also his musical picture, in the same oratorio, of the rising sun, the slow swell of the instruments in ascending notes describing the gradual progress of the luminary towards the horizon, and the full power of the band depicting its refulgent splendour. And how beautifully the composer contrasts with the solar blaze, the soft, serene beams of the comparatively small orb which reflects its borrowed light! Madame de Staël heard the first of these most masterly compositions performed at Vienna, 'in a manner,' she tells us, 'worthy of the great work,' and describes the sound of the combined voices and instruments as *a terrible noise!* She adds, that *at the appearance of light it was necessary to stop one's ears*. We forgive the bad taste for the sake of the wit. This generally sagacious and acute, and always brilliant, writer, is quite an Italian in her musical criticism: she says that the Germans 'put too much mind in their works; they reflect too much on what they are doing.' Of Mozart, whose illustrations of the poet are enumerated among his excellencies by most critics, Madame de Staël speaks in what we consider highly laudatory terms, but by which she means to express some degree of disapprobation. She thinks that 'of all musicians he has shown most skill in "marrying" the music to the words:' that in his operas, particularly *Don Giovanni*, he makes us sensible of all the effect of dramatic representation: that 'this ingenious alliance of the musician and poet gives us a sort of pleasure, but it is a pleasure which springs from *reflection*, and *that* does not belong to the wonderful sphere of the arts.' (*De l'Allemagne*.) The 'alliance' here complained of could not have been alleged as a fault in Rossini's earlier works, beautiful as some of them are in other respects; though the air 'La Calunnia,' the first finale in *Otello*, and two or three other things, offer as fine examples of what is meant by musical imitation as can be found. But in his 'second style'—the manner in which his later operas are written—he seems to have been *infected*, as Madame de Staël would have said, by German intellectuality. We know not if the highly-talented lady whose judgment in music we have ventured to impugn was acquainted with the compositions of Weber; if she ever heard his *Freischütz* or *Oberon*, he must have been placed by her very high on the list of those who damage and degrade music by rendering it expressive,—who, as Pope ironically says, in some lines complimentary to Handel,

> '—— meanly borrow aid from sense.'

MUSIC, which is both a science and an art, is divided into *Speculative* or theoretical, and *Practical*. Speculative Music explains the nature of musical sounds; shows, by demonstrating their ratios, how they are related to each other; and investigates their physical and moral effects when in a simple or in a combined state: it is, in few words, the philosophy of the art. Practical Music is the application of theoretical principles,—the proper conduct of sounds as to their progression, duration, union, and adaptation to words, voices, and instruments, and is the art of composition. The performer, who merely executes, stands in the same relation to music as the actor does to the drama, or the reciter to the poem: though he requires, in order to excel, considerable knowledge of the subject and superior taste, yet he is but an operator—a singer or a player, and not, strictly speaking, a musician.

Speculative Music is subdivided into Acoustical, Mathematical and Metaphysical. [ACOUSTICS; HARMONICS; SOUND; TEMPERAMENT.] Practical Music, into Vocal and Instrumental, the several kinds of which are noticed under their respective heads. The chief component parts of practical music are, MELODY, HARMONY, and RHYTHM, to which we refer. See likewise ACCENT, AIR, CHORD, COMPOSITION, COUNTERPOINT, MODULATION, THOROUGH-BASE, TIME, &c.

MUSIC, HISTORY OF. The origin of music is involved in an obscurity which no ingenuity, no labour, has hitherto

been able to dispel; analogy and conjecture therefore have supplied the want of facts, in the absence of any assistance except what doubtful histories and the fables of mythologists have afforded, which at best have held out but a dim light, and more often misled than aided the inquirer in his researches.

It has been supposed by some writers whose names stamp a value on all that has proceeded from them, that song and speech are coeval, an opinion which will hardly be disputed, if by song are meant sounds which, though vocal and sustained, are devoid of rhythm, governed by no scale, and consequently productive of no melody, in the modern acceptation of the word: but if the term is intended to signify a regular system of tunable, measured notes, then we shall not hesitate to say, that such advance towards art could only have been made by people proceeding fast in civilization, and communing through the medium of a language adequate to all the ordinary purposes of man in a social state.

We are told by Lucretius, in a passage often quoted from the fifth book of his poem *De Rerum Natura* (*Of the Nature of Things*), that the birds taught man to sing, and that the invention of musical instruments of the inflatile kind was suggested to him by the sounds produced from reeds when the western wind blew over them.

'——————— the birds instructed man,
And taught him songs before his art began.
And while soft evening gales blew o'er the plains,
And shook the sounding reeds, they taught the swains;
And thus the pipe was fram'd, and tuneful reed.'

This has certainly the merit of being very poetical, whatever reliance the historian may place on it. The same notion concerning wind instruments is found in Ovid's beautiful account of the transformation of the nymph Syrinx into reeds. But Thomas Aquinas, the 'Angelic doctor,' cited by the good Padre Giambattista Martini, in his *Storia della Musica*, disdains to follow the example of the heathen author of the 'Metamorphoses,' or the disciple of Epicurus, and leaves the origin of music to chance; on the contrary, the noble Italian saint informs us that the first man was endowed by the Creator with every kind of knowledge, and that he excelled in music, as well as in all other arts and sciences.

But quitting the ingenious guesses and fictions of poets and the reveries of enthusiasts, we find Jubal, the seventh in descent from Adam, mentioned in Scripture as 'the father of such as handle the *harp* and *organ*.' These terms however must not be understood quite literally; they are generic, and signify all instruments of the stringed and tube kind. The different versions vary in the translation of the original: the French render the word *harp* by *violon*. Though the earliest authentic record of music extant is that in *Genesis*, yet it is nearly certain that the Jews acquired their knowledge of it from the Egyptians. That Moses himself was educated by Pharaoh's daughter as her own son, and was 'learned in all the wisdom of the Egyptians,' is stated in the *Acts of the Apostles*; and Clemens Alexandrinus adds, that 'he was instructed by them, in his maturer age, in arithmetic, geometry, rhythm, harmony, but, above all, in medicine and music.' The whole generation of the Israelites led forth by the lawgiver from their captivity were born in Egypt, in which it seems to be agreed music as an art originated; though Diodorus Siculus even denies that it was ever practised there: but his assertion is not only in opposition to Herodotus, and at utter variance with what Plato says, who travelled into that country to become acquainted with the arts and sciences, but is proved by modern discoveries to be the very reverse of truth. The fresco painting of a harp, found by Bruce in an antient tomb near the ruins of Thebes, which is undoubtedly of very high antiquity, is an indisputable proof of the progress made by the early Egyptians in music. In form, dimensions, and ornament, this instrument might be mistaken for one of modern date, insomuch that when a drawing of it was first shown in London, considerable doubts were entertained of its fidelity. Forty years after, however, M. Denon bore testimony to the truth of Bruce's description and the accuracy of his sketch; since which Rosellini's *Monumenti dell' Egitto*, a splendid work published in 1832, has confirmed all that the two former had said on the subject. Another instrument, which is found sculptured on an Egyptian obelisk brought to Rome by Augustus, furnishes additional evidence of the state of music in Egypt in the remotest times. It is fully described by Dr. Burney, who gives a wood-cut of it, by which it appears that it was nearly the same as the Neapolitan *Calascione* of the present day. It had only two strings, but, being provided with a long neck, was capable of producing that series of sounds which the antients called a heptachord; and if the strings were tuned fifths, like those on the calascione, they would give a complete octave, an advantage which none of the Grecian instruments possessed till many ages later. Montfaucon says that 'in examining the representations of near five hundred antient lyres, &c., he never met with one in which there was any contrivance for shortening strings, during the time of performance, by a neck and finger-board.' These two instruments then are sufficient proofs of early Egyptian knowledge in the musical art.* That it continued to be cultivated in Egypt under the Macedonian dynasty there can be no doubt. Athenæus, in his account of a Bacchic festival given by Ptolemy Philadelphus—the munificent patron of all the liberal and useful arts, who made Egypt the mart of the world—tells us that more than six hundred musicians were employed in the chorus, and that among these were three hundred performers on the cithara, or lyre.

Of the music of the Hebrews, nearly all that is known is to be collected from the Scriptures, and the Bible is in the possession of every one. There we meet with the first recorded song, which Moses sang at the head of the tribes, after the miraculous passage of the Red Sea. To this responded Miriam the prophetess, having a timbrel or tambourine in her hand, and being attended by all the women, carrying the same instruments, and dancing. Music formed an essential part of every Jewish ceremony. The priesthood were musicians by office, which was hereditary: they were four thousand in number, divided into bodies, each of which had its chief or leader. At the dedication of Solomon's temple, a prodigious band of priests, blowing trumpets, attended. Josephus tells us that 200,000 musicians were engaged; but as his statement is unsupported by scriptural history, we may venture to consider it as a mistake arising from some misapprehension, or else as a manuscript error. A Hebrew writer enumerates thirty-six musical instruments that were kept in the sanctuary, on all of which, he says, the prophet-king David could play. These are reduced to thirty-three by another account. It is worthy of remark that many of them, under other names, are still met with in the East and in Egypt, and, as far as can be ascertained, very little changed from their original form. Martini has given, from a manuscript of 1599, what he believes to be specimens of the melodies sung by the Jews to certain Psalms; but they are printed in the obsolete notation, without bars, and having no words added to them by which the measure might perhaps have been made out, it is impossible to enter thoroughly into their meaning.

The Music of the Greeks has engaged the notice of so many searching antiquaries and patient mathematicians—such profound learning and unwearied labour have been bestowed on it—it has provoked so much controversy, and the dispute has proved so barren, that we enter on the subject reluctantly, if not fearfully; and though bound to give it as much attention as a matter of some importance is entitled to, yet we do not deem it expedient or feel inclined to afford it more than is rigorously its due. Dr. Burney, who had devoted months, if not years, to the inquiry, declared to a friend, a few months before his decease, that 'he never understood the Greek music, or found any one that did understand it.'

But before proceeding further, we think it right to say, with all possible respect for those who have toiled in this unproductive field, that, after a diligent investigation of the subject, on which we entered with an unprejudiced mind, it is our decided opinion that what is now called Greek music has hitherto proved perplexing chiefly, if not solely, on account of the term having been misunderstood. We believe that by *mousikè* (μουσική) the Greeks meant *poetry sung*, with some sort of accompaniment, and that the moderns have fallen into error by overrating the importance of the melodic part, treating this as the principal, and poetry only as an ally.

Music was a comprehensive term with the Greeks, embracing among other things which we shall have occasion

* There are some Egyptian paintings in the British Museum, which were brought from the grottoes in the western hills of Thebes. In one of them (No. 179) a female figure is represented blowing the double pipe, and another appears to be playing on a musical instrument. (*Lib. of Entertaining Knowledge: British Museum*, vol. ii., p. 79.)

to mention, melody (*Melopœia*—literally the *making*, or composition, *of the song*) and poetry. There is no one, M. Villoteau remarks, who, after an attentive perusal of the antient writers, is not convinced that eloquence, poetry, and melody were, in early times, governed by musical principles; that they were taught by the same master, and that the three arts were but one science. 'The goddess Persuasion,' says Lord Shaftesbury, 'must have been in a manner the mother of poetry, rhetoric, music, and the other kindred arts;' and tradition, he adds, 'could not better represent the first founders of large societies than as real songsters. . . . . . . Nor can it be doubted that the same artists who so industriously applied themselves to study the numbers of speech, must have made proportionable improvements in the study of mere sounds and natural harmony.' The Greeks never separated poetry from melody; the poet himself set the notes to his own verses, and in the early times sang them at the public games and festivals. The Greek tragedies were *operas*, observes Payne Knight, meaning, we presume, that they were in a kind of recitative; and he is borne out in his assertion by the best authorities. Aristotle, in his treatise on poetry, considers the *music* of tragedy as one of its most essential parts. The nature of this *music* is indicated by several writers, but is more clearly pointed out by Philodemus than by any other, in his work in abuse of music (one of the *papyri* found in Herculaneum, unrolled and published at Naples in 1793), wherein it is described as a melody nearly approaching ordinary speech; that is to say, recitative. Horace calls Apollo *the singer*. The antient poets give us to understand that their verses were *sung*, and this is to be construed literally in the case of the Greek poets. Homer, according to tradition, sang his own epics. But it is needless to multiply proofs of a fact so generally received.

Admitting, then, that Greek poetry of all kinds, religious, epic, dramatic, &c., was really sung, and perhaps granting, what many believe, that oratory partook much of the nature of song, let us inquire what was meant by the word *singing*. It is not to be imagined that Homer, Tyrtæus, Pindar, &c. were singers, in our acceptation of the word; the supposition is too absurd to be entertained for a moment. But even allowing them to have been as perfect in the vocal art as the moderns are, would they have condescended to deliver their poetry in long flights of notes, in divisions, in trills, and in passages that render it difficult, and sometimes impossible, to get at the sense? If, however, they had attempted to make their 'heaven-bred poesy' subservient to song, would they have found a patient audience?—Assuredly not; for the animating appeal, the interesting narrative clothed in poetical language, the pathetic description, were what the Greeks delighted in, and certainly would not have surrendered for the sake of a tune. Moreover, it must be recollected, and is a very important consideration, that when the art of printing was unknown, and manuscript copies of poems, &c. were unattainable by the people at large, on account of the expense, the multitude had no means of becoming acquainted with the productions of their poets but by hearing them recited; and as crowds assembled for this purpose, the best mode of rendering the voice of the reciter audible to many, and these congregated in open places, was, to pitch it rather high, and confine it to a small number of fixed musical notes. Such is still the practice, and with the same intent, in all cathedrals, and is called chanting, a usage which has doubtless been transmitted from the remotest ages. Such too is the method adopted by the *improvvisatori*, whose art, we are persuaded, is of the highest antiquity, and whose singing, it is our belief, much resembles that of the ancient Greeks in delivering their verses. Those extemporaneous poets always require an instrumental accompaniment of a simple kind, to keep the voice in tune, and, as they confess, to animate them. The Greek reciters also were accompanied, either by the lyre or the flute, and probably for the same purposes. The flute was the companion of elegiac poetry; the lyre of the epic and the ode.

By what is called Greek music, therefore, we understand the union of poetry and music, the former of the two exercising the greatest sway over the mind, because expressing noble sentiments—gracefully inculcating religion and morality—teaching obedience to the laws—exciting generous feelings—and inspiring patriotism and courage by the praise of those who had distinguished themselves by their public services and their valour. It is thus we account for the effects said to have been wrought by antient music; for it is impossible that Plato should have been thinking of mere vocal melody and the sounds of mean and imperfect instruments, when he said that no change can be made in music without affecting the constitution of the state, an opinion in which Aristotle acquiesced, and Cicero afterwards adopted:—it is not to be credited that the laws of Lycurgus, set to measured sounds by Terpander, were turned into a song, or that this Lesbian musician quelled a sedition in Sparta by singing some pretty air to the mob:—it is absurd to suppose that when Polybius tells us of a savage nation civilised by music, he means to say, by coarse pipes and guitars;—and not less ridiculous is it to imagine that men were raised to the rank of chiefs and the dignity of legislators, solely on account of their taste in singing, or their skill on the lyre and the flute.

We cannot quit the subject of the vocal music of Greece, without adding a few words concerning the Greek *Nomes* and *Scolia*. The former (from νόμος, nomos, *a law*) were so called, says Plutarch, because they were not allowed to transgress certain melodic rules by which they were characterised, and were at first hymns to the Gods. The latter were songs of a less restrained kind, sung at banquets and entertainments, by great proficients; hence Hesychius derives the term from σκολιὸς (skolios, *difficult to sing*). But others think that the word should be rendered literally,—*crooked, following a tortuous course*—because, at table, it did not pass regularly, but only to those who were skilful singers. Plutarch, on the authority of Pindar, tells us that the *scolia* were invented by Terpander. Dr. Burney has an entertaining chapter on the subject, vol. i., 464; but the reader will find it more learnedly discussed in Potter's 'Antiquities,' ii. 403.

As to the instrumental music of the Greeks, we confess our inability to treat the subject in a satisfactory manner. The accounts given of it by the ancient writers are either so suspicious or so indefinite, that nearly all our labour in endeavouring to gain some knowledge of its nature has been expended in vain. Having Bianchini's learned work on ancient instruments before us, we are enabled to form some opinion of their capabilities, and our opinion is not in their favour. They appear to have been rude, and suited only to music of the simplest description.

The Musical scale, or disdiapason, of the Greeks comprised two octaves, the lowest note of which was A, the first space in the base of the moderns. This was divided into five Tetrachords, or subdivisions of four sounds in each, the extremes being at the distance of a fourth. [TETRACHORD.] And it must here be observed, that the antient lyre had but four strings; the first and fourth fixed, the middle ones admitting of being tightened or relaxed according to the genus of the melody. Two conjoint tetrachords, with one additional note, formed the Octachord, or octave, to which the improved lyre extended. The three different divisions of the tetrachord produced as many Genera [GENERA], the Diatonic, the Chromatic, and the Enharmonic; which see. The first was composed of the sounds which the moderns name E, F, G, A; the second of E, F, F♯, A; the third of E, E×, F, A. The notes, or sounds, were represented by the letters of the alphabet, great and small, which, in order to extend their application and distinguish the various modes, were placed in different positions—the direct, the averted, the inverted, and the horizontal; and these were, as occasion required, altered in form. The time, or duration, of the notes was known by the long and short syllables to which they were set; the long syllable was in duration as two; the short as one. But we know only the comparative times of these; of the positive lengths of notes we remain in ignorance. The movement however of Greek music is supposed to have been slow. The Modes were, according to Alypius, fifteen in number: Aristoxenus makes them thirteen, each a semitone distant from the next in order. Under the word MODE we have given the table of Alypius; we here insert that of Aristoxenus, the oldest of the Greek writers on music, which commences with the Hypodorian, the lowest.

Hypodorian		B
Hypophrygian,	*Grave*	C
Ditto	*Acute*	C♯
Hypolydian	*Grave*	D
Ditto	*Acute*	D♯

Dorian		E
Ionian		F
Phrygian		F
Æolian, *or grave Lydian*		G
Lydian	*Acute*	G♯
Mixolydian	*Grave*	A
Ditto	*Acute*	A♯
Hypermixolydian		B

It will be here observed, that what may be called the key-note of the various modes does not agree with that in the table before given. In the above we have followed the Abbé Barthélemy, after having in vain resorted to numerous authorities for some means of reconciling the discrepancy. No two writers on this obscure subject are thoroughly agreed, and it is probable that none in future will attempt to explain that which holds out so little hope to labour and patience, and offers so small a reward for success. The three principal and most antient modes had different characters: the Dorian was grave and majestic; the Lydian, soft and complaining; the Phrygian, bold, enthusiastic, and used in religious ceremonies. Plato banished the Lydian and Ionian modes from his Republic, because exciting the enervating passions; but the Dorian and Phrygian he allowed, as manly and decent. Pindar set his fourteenth Olympic ode to the Lydian, as being addressed to the Graces. According to Lucretius, the Phrygian was employed in the horrid solemnities of Cybele; and Statius introduces it in the funeral rites of Archemorus.

By the word μέλος (*melos*) the Greeks generally signified what we call air, or something like it; but sometimes, Twining remarks, 'they used it in the sense of ἁρμονία, i.e. *melody* abstracted from rhythm, or time: sometimes for *measured melody;* and sometimes as equivalent to *song*, including melody, rhythm, and words.' By ἁρμονία (*harmonia*) they intended simply to express, as we have in a former article observed, the proper relationship of one sound to another—the pleasing agreement of intervals; that is to say, melody. Metastasio believes that by this term the Greeks signified what we mean by melody, founding his opinion on the following passage from Plato (*De Legib.*, lib. ii.):—*The regulation of the movement is called* rhythm; *but the regulation of the voice is called* harmony. Rousseau says—'The sense given by the Greeks to this word, in their music, is the more difficult to ascertain because, having originally been a proper name, it has no roots by which it can be decompounded in order to arrive at its etymology. In the antient treatises which remain, *harmony* seems to be that which had for its object an agreeable succession of sounds as regards high or low, in opposition to the other parts called *rhythmica* and *metrica*, which relate to time and measure.' But though very difficult to determine with exactness the meaning of the word harmony as applicable to Greek music, yet this difficulty does not arise from the cause assigned by the French writer.

The long-contested question, whether the Greeks understood counterpoint, or music in parts, seems now to be set at rest, and determined in the negative by a preponderating weight of authority and a large majority of voices. To what we have before remarked on this subject [HARMONY], we now add, that further inquiry and reflection have only confirmed the opinion we have long entertained, namely, that though the antients, by mere accident, if not from experiment, must have been acquainted with the effect of simultaneous sounds, nevertheless that which we call harmony formed no part of their musical art, either theoretically or practically. And we repeat our belief, that in the union of poetry and song, which undeniably operated with such amazing force on all classes of the people,—which inflamed them with ardour, softened them into obedience, and melted them into pity,—music was but the ally of verse.

Of their instrumental music, or music without the voice, we are told that the flute-players by profession—who certainly were exceedingly encouraged and most extravagantly paid for their services in the later times of Greece—piqued themselves chiefly on the strength of the sounds they could produce from the instrument; and that the trumpeters thought themselves fortunate if, in their contests at the public games, they escaped without the rupture of a blood-vessel by the violence of their exertions. It is to such performances Aristotle must allude in saying, 'I disapprove all kinds of difficulties in the use of instruments, and, indeed, in music generally; I mean such tricks as are practised at the public games, where the musician, instead of recollecting what is the true object of his art, endeavours only to flatter the corrupt taste of the multitude.' Facts and remarks like these do not lead to any favourable opinion of Grecian performers. It is likely however that they pleased most when they played the airs set to the favourite poems and popular verses. And there seems some reason to believe that they extended these by additions, sometimes studied, but often extemporaneous, resembling what are in modern language called variations, or an amplification of the theme.

It was a tradition that Cadmus, with his Phœnicians, introduced music into Greece. But Plutarch, in his 'Dialogue on Music,' first makes Lycias, a professor of the art, repeat the statement of Heraclides, that Amphion, the son of Jupiter and Antiope, taught the Greeks to compose and sing lyric poetry: then, by a second interlocutor, Soterichus, contradicts the first, assigning to Apollo the merit of having converted Greece into a musical nation. The invention of the lyre of three strings is given to the Egyptian Mercury, or Thoth; that of seven strings, to the second or Grecian Mercury. Chiron, the centaur, taught Achilles music. Orpheus was the musical pupil of Linus, and master of Hercules. Then came Olympus, Terpander, and others. Terpander is said to have appeased an insurrection in Lacedæmon by his songs. He rendered a most important service to the art by inventing a method of representing musical sounds. Till his time music was quite traditional, and depended on the memory, and sometimes the caprice, of the performer. Plutarch says of him, on the authority of Alexander, an historian, that he took Homer for his model in versification, and Orpheus for the style of his melodies. The musical compositions of Orpheus, the same writer adds, were wholly original.

Many very celebrated players on the flute are mentioned in musical history. Damon taught Pericles and Socrates the use of this instrument. Antigenides and Dorion were also renowned for their talents. But the performer who excited most admiration was of the gentler sex. Lamia was no less distinguished by wit and ability than by personal charms. After captivating many by her skill as a flute-player, and by her beauty, Demetrius Poliorcetes became violently enamoured of her, and, through her influence, conferred such extraordinary benefits on the Athenians, that they dedicated a temple to her. Whatever may have been the style of flute-playing, or of the music, it is certain that in Greece the performers were in great favour. Xenophon says, that if an indifferent player wished to pass for one of superior talent, he must furnish his house richly, and appear abroad with a large retinue of servants, as the great performers do. It is said that a flute used by a celebrated Theban musician, Ismenias, cost nearly six hundred pounds sterling.

Pythagoras, of whom an idle story was long current, about a blacksmith's shop, hammers, and anvils, contributed much to the improvement of music by his calculations and philosophical experiments. To him also is attributed the addition of an eighth string to the lyre. His notion concerning *the music of the spheres*—music produced by the motions of the heavenly bodies—was one of those whims in which great geniuses are apt, now and then, to indulge. He was of the sect of severe musicians, of those who reduced music to mathematical precision, and regulated all sounds by calculations, allowing no licence to the ear. Of an opposing school was Aristoxenus, born at Tarentum in Italy, about 350 years B.C., who thought the ear entitled to share with mathematical principles in determining the effect of modulated sounds. He was a most voluminous writer on many learned subjects. Of these his *Elements of Harmonics* are all that have reached us, and stand first in the collection published by Meibomius. Next in that excellent work is an *Introduction to Harmonics*, by Euclid, the geometrician; and this is followed by his *Section of the Canon*, containing short and clear explanations of the constituent parts of Greek music. Ptolemy, an Egyptian, and not the astronomer, wrote a treatise in three books on *Harmonics*, which Dr. Wallis printed, with a Latin version, a preface, and appendix, in 1682. He enters at large and deeply into the subject, and his principles have a tendency to reconcile the hostile sects of Pythagoreans and Aristoxenians. This object was pursued with success, by Sir F. H. Styles, in his paper published in the 51st volume of the *Philosophical Transactions*. In Plutarch's 'Dia-

logue on Music' much information concerning antient Greek music is to be found, but not of the most valuable kind. Aristides Quintilianus wrote a treatise on music, printed in the collection of Meibomius, which has proved a useful work to all subsequent writers on the subject. He was enthusiastic and fanciful, but in matters of fact and calculation is worthy of confidence.

The Romans acquired all their knowledge of the arts and sciences from the Greeks; their music therefore in no way differs from that of the latter; though they must have had some kind of song before any direct intercourse had taken place between them and the polished nations of Greece. It is certain that the art was never advanced by that war-like people, notwithstanding the share it had in all their religious ceremonies and public games, and the use made of it to animate their troops and add effect to their triumphs, and though it formed an essential part of their theatrical exhibitions of every kind, and was even adopted, or affected to be adopted, as a profession by one of their emperors.

The importance of music in the estimation of the early Romans is shown by a regulation attributed to Servius Tullius, who, in dividing the people into classes, directed that two whole centuries should consist of *trumpeters, blowers of the horn*, &c., and of such as, *without any other instrument, sounded the charge*. It is further proved by a law of the Twelve Tables, which limited the number of *players on the flute* at funerals to ten. And another of those laws enacted, that at the praises of honoured men in the assemblies of the people, there should be mournful songs accompanied by a flute. But a passage in Livy leaves no doubt on this subject, and being as curious as it is illustrative, we shall give it entire, availing ourselves of Dr. Burney's translation. 'I should omit a circumstance,' he says, 'hardly worth mentioning, if it did not seem connected with religion. The *Tibicines* (or flute-players), taking offence at the preceding censors for having refused them the privilege of eating in the temple of Jupiter, according to custom, withdrew in a body to Tibur (Tivoli), so that there were no performers left to play before the sacrifices. This created religious scruples in the minds of the senators, and ambassadors were sent to Tibur to persuade the fugitives to return to Rome. The Tiburtines promised to use their utmost endeavours to this end, and first summoning the discontented band before their senate, exhorted them to return to Rome: but finding them deaf to reason or entreaty, they had recourse to an artifice well suited to the dispositions of these men; for, on a certain festival, they were all invited, under pretence of assisting in the celebration of a feast. As men of this profession are generally much addicted to wine, they were supplied with it, till, being quite intoxicated, they fell fast asleep, and in this condition were flung into carts, and carried to Rome, where they passed the remaining part of the night in the Forum, without perceiving what had happened. The next day, while full of the fumes of their debauch, upon opening their eyes they were accosted by the Roman people, who flocked about them, and having been prevailed upon to stay in their native city, they were allowed the privilege of strolling through all the streets in their robes, three days in every year, playing on their instruments, and indulging in those licentious excesses which are practised on the same occasion to this day' (that is, to the time of Augustus). 'The privilege of eating in the temple was also restored to such as should be employed in playing before the sacrifices.' This happened 309 B.C. 'The Roman flute-players,' Burney adds, 'were incorporated, and formed into a *college* or company.' Ovid, in his 'Fasti,' (lib. vi.), acknowledges the importance of the *Tibicines*, and repeats in verse the above story of Livy, but drops the scruples of the *Patres Conscripti*.

That the Roman drama was in some way musical, is proved by the title, or *didascalia*, prefixed to each of Terence's plays. A further proof of this is found in the Institutes of Quintilian, where, after showing the necessity of instructing children in music, he adds, 'that he does not desire that they should learn such music as prevails on the stage, the modulations of which are so intermixed with impudence and wantonness, that they may justly be charged with having extinguished the poor remains of manly courage which had been left.' That the theatrical music of the Romans was similar to that of the Greeks there seems to be little doubt; that it was distorted by the performers in Quintilian's time is very likely.

It is remarked by Dr. Burney, that even during the Augustan age the Romans had no sculptor, painter, or musician, and but one architect, Vitruvius; those, he says, 'who have been celebrated in the arts at Rome having been Asiatics or European Greeks, who came to exercise such arts among the Latins as the Latins had not among themselves. This custom was continued under the successors of Augustus; and those Romans who were prevented from going into Greece contrived in a manner to bring Greece to Rome, by receiving into their service the most able professors of Greece and Asia in all the arts.'

The Roman writers on music are few, and almost worthless. Vitruvius, in his work on architecture, treats of the sound of the voice, of reverberating vases, and of a *water-organ;* but no one has yet been able to discover what he means by this instrument. He also endeavours to make plain the harmonical system of Aristoxenus, though he acknowledges the difficulty of the task. St. Augustin wrote on rhythm and metre; Boethius devotes five books to music, merely to explain the principles of harmonics; and Aurelius Cassiodorus treats of music, among other things, but his work, or sketch, is said to consist of little more than some general definitions and divisions.

There is every reason to conclude that music remained stationary till the tenth or eleventh century. The Romans, having borrowed the art from Greece, seem to have been convinced of its perfection in the state in which they received it, for there is no evidence of their having attempted to enlarge its narrow boundaries, or in any way to improve it; though a people of more ingenuity and taste would have advanced it at least a few steps towards that point which it slowly has attained.

In the primitive Christian church the service consisted partly of music, which is supposed to have been chiefly that of the Greeks, with an admixture of Hebrew melody. Menestrier conjectures that the early ecclesiastical manner of singing was like that of the ancient theatre, and Dr. Burney concurs in this opinion; though we cannot but think it more likely that the 'songs of Zion,' as performed in the Jewish temple, and the chanting of the hymns at the Pagan altars, were chosen as vocal models for devotional purposes, rather than the airs, or recitatives, in which the comedies of Plautus and Terence were delivered. Towards the end of the fourth century, St. Ambrose digested a musical service for the church of Milan, which is called the Ambrosian chant, and was founded on four of the Greek modes. About the year 600 Gregory the Great enlarged and much improved the chant of the church, by the admission of four other modes, and gave it that form which it still retains in the Catholic service, and in which it is known by his name. According to Bishop Stillingfleet, music was introduced into the English church by St. Augustin, in the latter part of the sixth century, and was subsequently much improved by St. Dunstan, an excellent musician, who, it is said, furnished some few churches with an organ.

The organ—the most majestic and comprehensive of all musical instruments in its present almost perfect state—is supposed to have been an improvement of the hydraulicon, or water-organ, of the Greeks. The first mentioned in musical history was sent, in 757, as a present to King Pepin, from the Byzantine emperor Constantine Copronymus. In the tenth century the organ was in use in several parts of Europe; but it is reasonable to conclude that it was then exceedingly simple, possessing little power, and rude in mechanism: nevertheless, it may fairly be assumed that the invention of the organ hastened the discovery or practice of harmony. [ORGAN.]

To Guido, of Arezzo, we are indebted for many of those improvements in music which led to our present system; though the origin of counterpoint has been erroneously ascribed to that active and ingenious ecclesiastic. [GUIDO.] *Magister* Franco, a member of the cathedral of Cologne in the eleventh century, is considered as the inventor of what in the middle ages was called *Cantus Mensurabilis*, which meant, notes showing, by their forms, their time or duration. Most of those, however, have fallen into disuse, for the shortest in his table is the semibreve. Nevertheless his system, carried out further by De Muris, and by degrees extended, till it has proceeded to an extravagant length—is that of the present day, and is so sound in principle that it probably will never be abandoned.

From the eleventh to the fifteenth century, scarcely anything is known of the progress of music. For its history

from the latter period, we refer to the biographical sketches of its most eminent professors which appear in our work;—to the articles ACADEMY, CONCERT, OPERA, ORATORIO, &c.;—to the names of musical instruments;—and to all the terms under which musical compositions of every kind are described. From these sources may be gathered much of the information, if not all, that will be required by the general reader.

MUSK. (Zoology.) [MOSCHIDÆ.]

MUSK. This substance is an extremely odorous secretion, lodged in a bag which is attached and peculiar to the abdomen of the male musk-animal. The elevated regions frequented by the creature, its timidity and speed in flight, render it very difficult to obtain the substance, while the high price borne by it offers great inducements to substitute other articles for that which is genuine. The musk-bag varies much in form, colour, size, and quality, circumstances which suggest the belief that it is procured either from two or more species of musk-animals, or that it has been obtained at different periods of the year, or from very differently-aged animals. In the very young animal the bag is quite empty, while in the old and feeble the musk is in small quantity and of inferior strength. It is said to be secreted in greatest abundance during the rutting season, and to have then its sensible qualities most developed. The secretion has a much stronger odour in the animal which inhabits Tibet and China than in that which frequents the more northern districts of Siberia. In the fresh state the musk has an extract-like consistence, and a reddish-brown colour, with an odour so powerful that the huntsmen can scarcely endure it. By drying this odour diminishes, and the musk acquires a friable granular state, and a dark-brownish colour. In Siberia the chase occurs in spring and summer. In Tibet the pursuit is restricted by the government to certain periods, and the bags which are obtained are stamped with the royal signet. In commerce two and occasionally three varieties of musk are met with.

1. The Tonquin or Tibet musk, received through the East India Company, occurs in small oblong-rectangular boxes, lined with lead, and covered with paper or silk. Each bag, or pod, as it is termed, is wrapped in thin blue or red paper, on which are marked some Chinese characters. Sometimes the bags are enveloped in a deep yellow-brownish nearly transparent paper, which becomes brittle by time. The most distinctive mark of this sort of musk is, that it is slightly flattened, nearly round, and very rarely pear-shaped. The yellow or yellowish-brown hairs, chiefly at the sides, are often cut, while those which remain in the centre are darker coloured, finer, and less bristly. Generally the hairs converge or point towards a small natural opening. The pods are mostly about two and a half inches long, and one and three-quarters broad. The weight of different specimens varies considerably, some being merely three drachms thirty grains, others nine drachms forty-seven and a half grains; the average is six drachms twelve grains. The average quantity of musk contained in the sacks is about two and a half drachms.

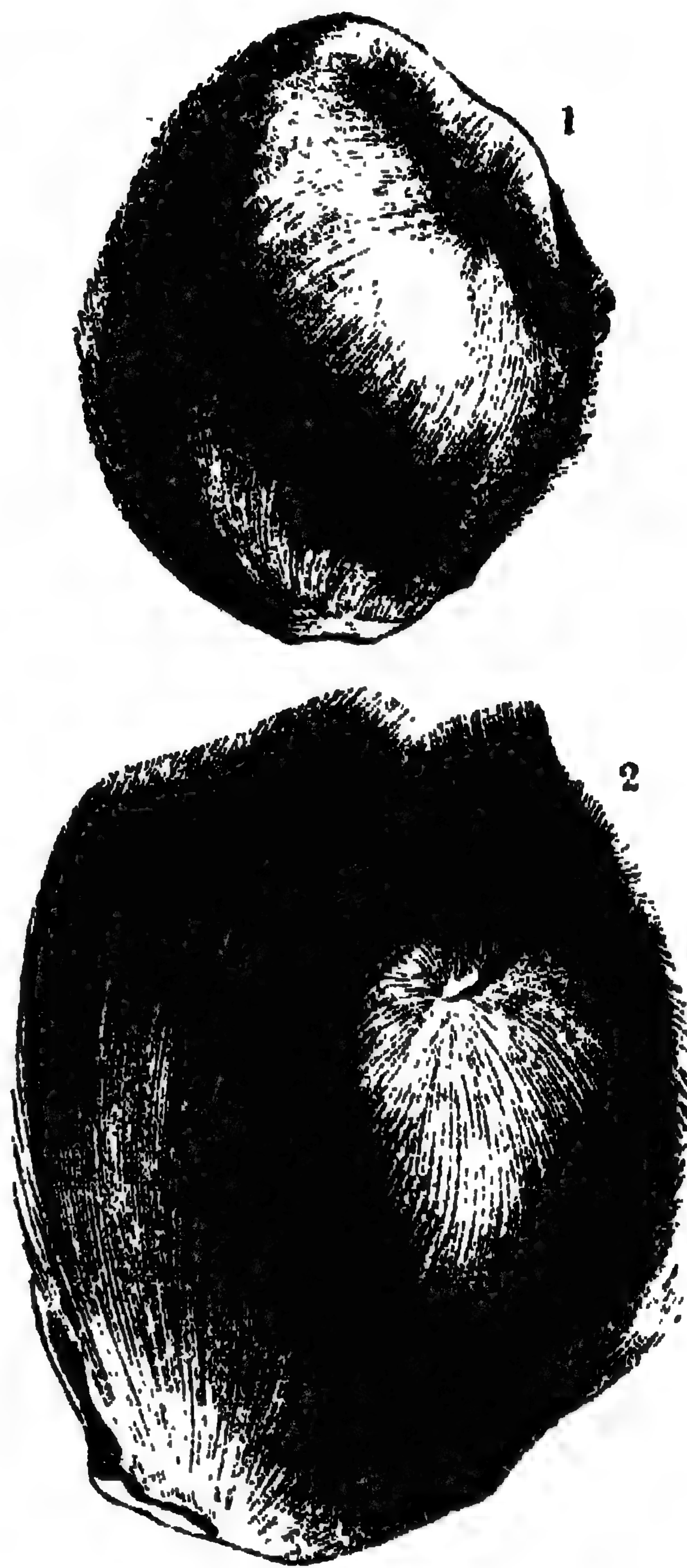
By careful removal of the bag, there remains the musk, which is solid, in grains of different sizes, adhering to each other, soft, and unctuous to the feel, of a reddish-brown colour, like a clot of blood dried, having frequently a number of hairs intermixed, derived from the inner side of the orifice already described. The taste is bitterish, acrid, disagreeable, and somewhat astringent. The odour is strong, peculiar (musky), penetrating, very lasting, and extraordinarily diffusible. It is stated that a single grain can constantly fill the air of a large apartment with a sensible impregnation for many years, without its weight being perceptibly diminished; and one part can communicate its odour to 3000 parts of an inodorous powder.

It should be kept in glass-bottles, very closely stopped, and preserved in a place neither very dry nor too damp.

By the analysis of Geizar and Reiman it appears to consist of: 1, a peculiar volatile principle (which can exist in a free state); 2, ammonia; 3, a peculiar, fixed, uncrystallizable acid (these three are in undeterminable quantity); 4, stearine and oleine; 5, cholesterine; 6, a peculiar bitter resin; 7, osmazome, with several salts; 8, a mouldy-like substance, in part combined with ammonia, and numerous salts; 9, sand; 10, water, acid, &c., with some volatile odorous matter.

It has not been ascertained upon what musk depends for its peculiar properties. It has been conjectured that a kind of putrefaction goes on which evolves the peculiar odour. Moisture seems to favour this, and musk which, when dry, yields little scent, becomes powerful when moistened. The odour is augmented by adding a few drops of the solution of subcarbonate of potass.

2. Kabardin, Russian, or Siberian musk, is either received through St. Petersburg, or, it is said, sent to China, and laid for some time among the bags of genuine Tonquin musk, to acquire the odour of the latter, and then shipped to Europe. The pods of this sort are in general larger, more oval, more compressed, and the margins often have large portions of the skin of the abdomen attached to them. The colour of the hairs is a dirty milk-white. The musk exhibits a more homogeneous and less granular appearance, having a much fainter odour and taste than the preceding kind. The odour is augmented by moisture, but is somewhat nauseous and disagreeable. The wood-cuts show the difference of aspect of the two kinds.



1, Tonquin Musk. 2, Kabardin Musk.

Musk is more soluble in water than in alcohol. Of 100 parts of genuine Tonquin musk, boiling-water dissolves 90 parts, alcohol only 50. Of Kabardin musk, water dissolves only 50 per cent. It is likewise soluble in æther, acetic acid, and yolk of egg.

3. A very small kind of pod is sometimes met with, which is not flattened, but perfectly round: the hairs of a yellowish-brown colour. This is probably the musk-bag of the Moschus Altaicus.

It is safest to purchase the musk out of the pod, as there is then less opportunity of adulteration. Infusion of genuine musk is not precipitated by a solution of bichloride of mercury (corrosive sublimate); but genuine musk is precipitated by nitric and other strong acids, by acetate of lead (sugar of lead), and infusion of galls. The musk-bags are used by perfumers to prepare 'essence of musk.' An artificial musk is sometimes made with nitric acid and oil of amber. This should never be used for medical purposes.

Taken in the dose of a few grains, musk rouses the energy of the digestive organs; and it soon afterwards produces sympathetic phenomena, the powers of the whole animal sys[illegible] till appearing suddenly increased. By repeating the [illegible] active prin- half a drachm or a drachm is consumed, [illegible]

ciples penetrate the whole frame, influencing all the tissues, and exciting effects demonstrative of its stimulating property; the blood circulates with more force, accompanied sometimes with bleeding from the nose: the perspiration and other secretions are perceptibly increased. Other effects prove that it also acts on the brain, spinal chord, and ganglionic nerves, such as tendency to sleep, convulsive movements, and particularly spasms of the chest and abdomen. Owing to idiosyncrasies, musk produces in some persons very extraordinary effects, at times so violent that they cannot bear the faintest odour of it.

Musk has been recommended in typhus and other fevers, when there exist low delirium, hiccup, twitching of the tendons, &c. But its beneficial action is not so constant as to justify much reliance upon it. It is much more useful in diseases purely nervous and spasmodic, where no inflammatory action has preceded or is present. Hence even in epilepsy, as well as hysteria, it is serviceable. In combination with ammonia it is useful in arresting a tendency to gangrene. Likewise in retrocedent gout it has proved successful. It was found of little avail in severe cases of Asiatic cholera, though useful in the milder forms of it.

MUSK-RAT. [MUSQUASH.]

MUSKERRY MOUNTAINS. [CORK.]

MUSKET. [ARMS, p. 373.]

MUSKINGUM. [MISSISSIPPI, River.]

MUSLIN, a thin cloth made of cotton. The name is supposed to be derived from Masalia, since called Masulipatam, from which place such fabrics were first imported into Europe. Until the early part of the present century all the muslin used in Europe was of the manufacture of India. These fabrics are still superior to any that are made in Europe, both as regards their fineness and their durability, which latter quality is not, as some people have supposed, the consequence of any superiority in the quality of the material of which they are made, for the raw cotton of India is far inferior to that which is used for these fine fabrics in Europe, and which is brought from America and from Egypt. The excellence of India muslins is owing to the skilfulness and patience of the spinners and weavers in that country. Some of the muslins of India, and especially those of Dacca, are of the most astonishing degree of fineness, so as to justify their poetical description as 'webs of woven wind.' Such however has been the result of the mechanical inventions of England in this branch of industry, that not only are muslins of British manufacture now used at home, to the exclusion of those woven in India, but large quantities are exported to all parts of the world, and find their way even far into the interior of India.

The great seat of the muslin manufacture in this country is Paisley near Glasgow. The greater part of the yarn used for these fine fabrics is spun in the cotton-mills of Manchester. Muslin cloths are both plain and figured. By a late invention they are sometimes embroidered by means of machinery.

MUSO'NIUS RUFUS, CAIUS, a Stoic philosopher of the first century of our æra, is mentioned with praise by Tacitus (*Ann.*, xiv. 59), and also by Pliny the younger, Philostratus, Themistius, and others. He was a native of Vulsinii in Etruria, and belonged to the Equestrian order. He was a friend of Thrasea Paetus, Barea Soranus, Rubellius Plautus, and other stoics, who were the victims of Nero's suspicion and cruelty. Musonius was banished to Gyaros, where he is said to have been visited by many Greeks for the purpose of listening to his lessons. Being recalled after Nero's death, he lived at Rome under Vespasian, who excepted him from the sentence of exile pronounced by that prince against the Stoic philosophers. This scanty information is all that we have concerning the biography of Musonius Rufus. (Nieuwland, *Dissertatio de Musonio Rufo, Philosopho Stoico.*) Fragments of his works are found in Stobæus, and have been collected and published, with the above dissertation and copious notes, under the title of 'C. Musonii Rufi, Philosophi Stoici, Reliquiæ, et Apophthegmata, cum Annotatione, edidit T. Venhuizen Peerlkamp, Conrector Gymnasii Harlemensis,' 8vo., Haarlem, 1822. These fragments of Musonius are full of the purest morality and wisdom.

MUSOPHA'GIDÆ (*Plantain-eaters*). Mr. Vigors* notices the genera *Musophaga* and *Corythaix* as nearly and evidently allied to the Gallinaceous families, and as being found among the Scansorial birds; and speaks of the genus *Vinago* [COLUMBIDÆ, vol. vii.] as united by their comparatively stronger and more solid bills to *Penelope* and *Crax*, which in his arrangement form the opposite extreme of the order *Rasores*, as well as to *Musophaga* and *Corythaix*, which approach the whole of the Rasorial groups and connect them with the *Perchers*. [INSESSORES, vol. xii.]

Mr. Swainson raises the group of *Plantain-eaters* to the rank of a family under the title which heads this article, and they constitute, according to his arrangement, the fifth great division of the conirostral tribe of perchers. Not that he considers it as by any means clear that *Musophaga* is the real type of the whole family, though he designates that genus as the most conspicuous of the group.

He thus characterises the family:—

Bill short, upper mandible high, the culmen arched, the margins either serrated or entire, the under mandible very thin. Feet short, formed for clinging. The toes various.

The place which this family occupies in Mr. Swainson's arrangement is next to the *Fringillidæ*, at the end of the *Perching Birds*, and immediately before the *Scansores*, intermediate between the *Finches* and the *Hornbills*. He observes that those which betray their affinity to the bullfinches are small, whilst others, whose size and peculiar structure assimilate them more to the hornbills, are of a size proportionate to those birds, remarking that, with the exception of one genus, they all possess a short but very strong and thick bill, more or less curved on the top, the cutting margins being minutely serrated, like the teeth of a saw. The food, it is stated, seems to be entirely vegetable, and of the most tender and delicate description: and Mr. Swainson remarks that it is singular to observe that the bill in this family (in outward appearance much stronger than that of the finches) should yet be employed in procuring the softest vegetable food; while the short bill, posterior nostrils, hopping gait, and purely vegetable food, are all exemplified in such birds as *Buceros galeatus*, and proclaim the affinity of the *Plantain-eaters* to the *Hornbills*.

Mr. Swainson further remarks that the economy of these birds, so far as they have been observed by travellers, is directly against the theory of their being likened to the gallinaceous order; and he quotes some of the statements of Cuvier and those of Yarrell in support of his opinion. The former, in the *Règne Animal*, states that *Corythaix* and *Musophaga* appear to him to have some analogy with the gallinaceous birds, and particularly with the Hoccos. They have the wings and the tail of those birds, and, like them, keep on trees; their bill, he continues, is short, and the upper mandible convex; their feet have a short membrane between the anterior toes; but it is true that the external toe is often directed backwards like that of the owls. Their nostrils also are simply placed in the horn of the bill, the edges of the mandibles are dentilated, and the sternum (at least that of the Touraco) has not the great notches which are ordinary in the Gallinaceous birds. Mr. Swainson observes that this admission of Cuvier, that *Corythaix* and *Musophaga* only present 'quelque *analogie* avec les gallinacés,' and that they have not the notched sternum of the latter, is directly opposed to the theory of these birds leading to the *Gallinacea*, a view of the subject which is confirmed by Mr. Yarrell's observations. The latter zoologist dissected a Touraco (*Corythaix Persa*) which had died in the menagerie of the Zoological Society of London, and he found the general appearance of the inside of the body of the bird inclining rather to that of the *Perchers* than of the *Gallinæ*. (*Zool. Journ.*, vol. iv., p. 319.) Mr. Swainson separates the family into the following subfamilies and genera:—

Phytotominæ, Plant-cutters.

Bill serrated, but not swollen. Feet with two or three toes forward and one backward. (Sw.)

Genera.

Phytotoma, Molina. *Hyreus*, Stevens. Of these we select *Phytotoma*.

Generic Character.—Bill short, compressed, the base widened; high at the base, and gradually curved; the lower mandible much weaker, straight; the commissure slightly arched, with the margins crested. Tongue short, pointed. Nostrils basal, small, rounded. Wings moderate; the two first quills graduated; tail moderate, even. Feet strong. Lateral toes unequal, the inner shortest. Claws slender, slightly curved. (Sw.)

* In 'Linn. Trans.,' Natural Affinities that connect the Orders and Families of Birds,' vol. xiv., pp. 476-481.

Example, *Phytotoma rara.*

Description, Habits, &c.—Molina describes the *Rara* or *Chilian Plant-cutter* as nearly of the size of a quail, with the bill rather large, conical, straight, a little pointed, serrated, and half an inch in length; the tongue very short and obtuse, the pupil of the eye brown. Three well proportioned anterior toes, the fourth posterior and a little shorter. The tail moderate, but rounded. The colour is an obscure grey upon the back, rather brighter on the belly; the points of the quills and of the tail are black. The sound of its voice is hoarse and interrupted, and seems to express its name. It feeds on plants, but previously has the destructive habit of cutting them off close to the root, and often capriciously cuts off a quantity of them without touching them further. For this reason the peasants persecute this species, and carry on a continual war against these birds; moreover children who destroy their eggs are rewarded. The nest is built in obscure and but little frequented places on the most lofty trees, and thus these *Plant-cutters* escape the persecutions of their enemies. Notwithstanding such precautions however, their numbers are considerably diminished. 'I do not know,' says Molina in conclusion, 'whether this is because a price is set on its head, or on account of its naturally small degree of fecundity.'



Chilian Plant-cutter.

Mr. Swainson observes that in *Phytotoma* the four toes appear to be arranged as in the *Finches*, but in *Hyreus* the toes are only three. He compares the size and entire aspect of *Phytotoma* to that of a *Bullfinch*.

Colinæ. Colies.

The only definition of this subfamily given by Mr. Swainson is, 'all the four toes placed forward,'* and the only genus contained in it is

Colius. (Brisson and Gmelin.)

Generic Character.—Bill short, strong, conical, slightly compressed, entire, with the mandibles equal and the edges arched; nostrils rounded; nails arched and long, that of the hind-toe shortest; wings short; third quill longest; tail graduated and very long.

Habits, Geographical Distribution, &c. of the Genus.—The plumage of the species is soft and silky, and the colours generally sombre, whence they are called at the Cape, according to Le Vaillant, *Oiseaux Souris* (Mouse-birds). Africa and the East Indies are the localities where they have been found, the *Colius viridis* of Latham, said to be from New Holland, belonging probably to another genus. The Colies are gregarious, live upon fruits, and are the scourges of gardens. They walk badly, but they climb almost continually on the branches of trees, where they hold on, assisting themselves with their bills like the *Parakeets*. They build their nests, which are spacious and round, in little groups; and Le Vaillant affirms that they sleep suspended with their heads downwards, and that, when it is cold, they are found so benumbed in the morning, that they may be taken one after the other. The number of eggs is generally five or six, and the flesh of the birds is said to be delicate. (Lesson.)

* Other authorities state that the hind-toe is versatile; and this would more accord with their climbing habits.

Example, *Colius Senegalensis.* (Latham.)

Description.—Round the eye a naked, reddish skin; forehead yellow; colour pearl-grey, with greenish reflections; abdomen ruddy.

This appears to be the *Colius Quiriwa*—the trivial name is taken probably from its note—of Le Vaillant; and the *Coliou huppé du Sénégal* of Buffon.



Colius Senegalensis.

Musophaginæ. Plantain-eaters.

Three toes forward and one backward; the outer toe placed obliquely. (Sw.)

Genera. Corythaix. (Ill.)

Generic Character.—Bill short, rather small, high, and greatly compressed. The frontal feathers reposing over and concealing the nostrils. Culmen high, curved to the tip. Lower mandible narrow; both mandibles distinctly notched at the tip and finely serrated. Wings short, rounded; the three first quills graduated. Tail long, broad, rounded. Feet short, strong. Middle toe longer than the tarsus; lateral toes equal, hind-toe shortest; external toe capable of being turned a quarter of the way backward. Claws short, thick, and much compressed.

The Touracos are most elegant birds, and feed principally on soft fruits. The prevailing colour of these birds is green, varied in some species with purple on the wings and tail. They are natives of Africa, where they perch on the highest branches of the forest trees, and thus keep out of gun-shot, as Le Vaillant found to his cost. Having at last succeeded in bringing one to the ground, he could not find it, and, stamping in his rage at the loss, he broke through into one of the covered pits which the Hottentots employed to catch ferocious animals, particularly elephants. This accident might have been fatal. 'When I recovered my first surprise,' says he, 'I began to consider how I should extricate myself from this embarrassment, ex-

tremely happy that I had not been impaled on the sharp-pointed stake placed in the bottom of the pit; and still happier that I found in it no company. I was however apprehensive that some might arrive every moment, especially if I should be obliged to remain there during the night.' In this dilemma Le Vaillant fired his fusee at intervals; the shots at last were answered, and he was delivered by his Hottentots. But he did not forget his Touraco, and now, by the aid of his dogs, which had followed the Hottentots, found it squatted under a tufted bush. He afterwards laid snares for them on the fruit-trees, to which they resorted to feed, and took them alive.

The following cuts will give but an imperfect idea of these elegant birds.



Head of Corythaix Senegalensis.*



Corythaix Senegalensis.

Perhaps the most delicate species is *Corythaix erythrolophus*, Sw.

Description.—Crest, which is red, erect and compressed; sides of the head, ears and chin, and patch round the eye (which is large, red, and brilliant), white; general plumage green, inclining to bluish on the body and belly; quills rich purple violet; tail rounded; bill yellow; feet greyish-black.

* N.B. The crest, when the bird is excited or in action, is elevated into a compressed subconical shape; and, when thus erected, it gives the head a helmeted air.



Head of Corythaix erythrolophus.

This beautiful species is the *Opæthus erythrolophus* of Vieillot; the *Musophaga Paulina* of Temminck; and *Corythaix igniceps* of Lesson.

Our figure was taken from a specimen that lived for some time in the gardens of the Zoological Society in the Regent's Park.

Locality, Africa.



Corythaix erythrolophus.

Several specimens of Touracos are to be found in our museums, and there are at present (September, 1839) two (*Corythaix Buffonii*) living at the gardens of the Zoological Society, Regent's Park.

Chizærhis. (Wagler.)

Generic Character.—Bill large, high and thick at the base, compressed beyond. Culmen thick, convex, considerably arched. Lower mandible not half so high as the upper; the tips of both deeply notched, with their margins finely crenated. Nostrils basal, placed close to the top of the bill, naked, lunular, and pierced in the substance of the bill. Wings lengthened; the four first quills graduated. Tail lengthened, slightly rounded; the tips very obtuse. Feet as in *Corythaix*. (Sw.)

Example, *Chizærhis variegata*.

Description.—Light grey above; a blackish stripe down each feather; front, top of the head, chin, and throat as far as the breast, chestnut-brown; under plumage beyond the breast white, but each feather with a dark middle stripe; primary and secondary quills blackish, with a spot of pure white varying in size in the middle of their inner webs; tertiaries and middle tail-feathers grey, tipt with black; lateral tail-feathers black; bill yellow; feet grey. Crest placed very far back on the nape. Total length about 20 inches.

This appears to be the *Touraco huppé-col* of Le Vaillant; *Phasianus Africanus* of Latham, and *Musophaga variegata* of Vieillot.

Locality, Africa.



Chizærhis variegata.

Musophaga. (Isert.)

Generic Character.—Bill resembling that of *Chizærhis*; but the base enormously dilated, so as to spread like a casque or helmet over the fore part of the head as far as the crown, where its thickened sides form a semicircle. Nostrils naked, oval, open, placed nearer to the tip than to the eyes, and pierced in the substance of the bill. Wings, feet, and tail as in the *Corythaix*. (Sw.)



Musophaga violacea.

Example, *Musophaga violacea*.

Description.—Bill rich yellow, passing into crimson; orbits naked, and, like the compact velvetty feathers of the crown, glossy crimson; a white stripe beginning below the eye and extending above the ear; secondary and part of the primary quills carmine, with lilac reflections, margined and tipped with blackish violet, which is the general colour of the plumage, only that it changes into a very deep green on the under parts, and is very rich on the tail; legs strong and black; gape wide, opening beneath the eyes.

This magnificent bird appears to be the *Cuculus regius* of Shaw.

Locality, Africa: Gold Coast and Senegal.

MUSQUASH, the Cree name for the *Fiber Zibethicus* of Cuvier (*Ondatra* of Lacépède), a genus belonging to the family *Castoridæ*.

Dr. Richardson (*Fauna Boreali-Americana*) gives the following synonyms of this rodent:—

Rat-Musqué of Sagard Theodat; *Castor Zibethicus* of Linnæus; *L'Ondatra* of Buffon; *Musk-Rat* of Lawson; *Musk-Beaver* of Pennant; *Musquash* of Josselyn; *Mus Zibethicus* of Lin., Gmelin; *Fiber Zibethicus* of Sabine and Harlan; *Musk-Rat* of Godman; *Ondathra* of the Hurons; *Musquash, Watsuss*, or *Wachusk*, also *Peesquaw-Tupeyew* (the animal that sits on the ice in a round form), of the Cree Indians.

In a tract which has for its title 'A Perfect Description of Virginia,' 1649, we find among the 'Beasts great and small,' 'A Muske Rat, so called for his great sweetnesse and shape.'

Dental Formula:—Incisors, $\frac{2}{2}$; Molars, $\frac{3-3}{3-3} = 16$.





Teeth of Musquash. (F. Cuv.)

Description.—Head short. Body thick and rather flat; legs very short; hind-feet large, not webbed.* Dark umber brown above; sides, anterior part of belly, middle of breast, lateral part of neck and cheeks, shining yellowish-brown; chin, throat, sides of the chest, and posterior part of the abdomen, ash-grey; tail compressed, convex on the sides, with its acute edges in a vertical plane, covered with a thin sleek coat of short hairs, which allow a number of small roundish scales, well separated from each other, and which, as well as the hair, are dusky-brown, to appear through them; acute margins of the tail (which is rather thicker in the middle than at the root, and tapers gradually from its middle to its extremity, which is not acute) covered with a close line of longer hairs dark brown on the upper edge and soiled white on the under one. Length of head and body 14 inches; of the tail 8 inches 6 lines.

The fur, which much resembles that of the *Beaver*, but is shorter, resists the water during the life of the animal, but is easily wetted immediately after death.

Habits; Utility to Man, Geographical Distribution, &c.—Charlevoix states that the Musk-Rat takes the field in

* Hearne erroneously says that the hind-feet are webbed.

March, at which time its food consists of bits of wood, which it peels before it eats them. After the dissolving of the snows, he says that it lives upon the roots of nettles, and afterwards on the stalks and leaves of that plant. In summer it feeds on strawberries, &c., to which succeed the autumnal fruits. During this time, he states that the male and female are rarely seen asunder. According to the same author, they separate in winter, when each takes up its lodgings apart, in some hole or in the hollow of a tree, without any provision; and the Indians declared that not the least morsel of anything is eaten by them whilst the cold continues. 'They likewise,' adds Charlevoix, 'build cabins nearly in the form of those of the beavers, but far from being so well executed. As to their place of abode, it is always by the water-side, so that they have no need to build causeways. . . The flesh is tolerably good eating, except in the time of rut, at which season it is impossible to cure it of a relish of musk, which is far from being as agreeable to the taste as it is to the scent.'

Dr. Richardson (*Fauna Boreali-Americana*), from whom the abridged description is taken, and to whose details we refer the reader, states that the Musquashes vary considerably in size, and that though they have a strong musky smell, particularly the males, in spring, their flesh, which somewhat resembles flabby pork, is eaten by the Indians, who prize it for a time when it is fat, but soon tire of it. They have, according to this author, three litters in the course of the summer, producing from three to seven at a litter, in 55° N. lat., and begin to breed before they attain their full growth. Great numbers are destroyed by the inundations which cover the low grounds where they haunt, and in severe winters they are almost extirpated from some localities by the freezing of the swamps inhabited by them. Famine in such cases drives them to destroy each other. A great mortality, the cause of which is unknown, also sweeps them away, and the deaths at such periods (which are uncertain) are so numerous, that a fur-post, where the *Musquash* is the principal return, is not unfrequently abandoned till the fecundity of the animal has repaired, which it does in a very few years, the ravages of disease.

Dr. Richardson places the southern limit of the *Musquash* about 30° N. lat. According to Bartram, they are found in the north of Georgia and Florida, and Dr. Richardson ascertained that they extended northwards to the mouth of the Mackenzie, 60° N. lat. Small grassy lakes or swamps, or the grassy borders of sluggish streams with muddy bottoms, are favourite haunts, and there they feed chiefly on vegetables. In the northern districts the roots and shoots of the bulrush and reed-mace, and the leaves of various carices and aquatic grasses, form their staple. Pennant states that they are very fond of the Sweet-flag (*Acorus Calamus*), which, according to Dr. Richardson, does not grow to the northward of Lake Winnipeg. The last-named author often saw small collections of fresh-water mussel-shells (*Unio*), on the animals of which they are said to feed, and which, he was informed, had been left by them.

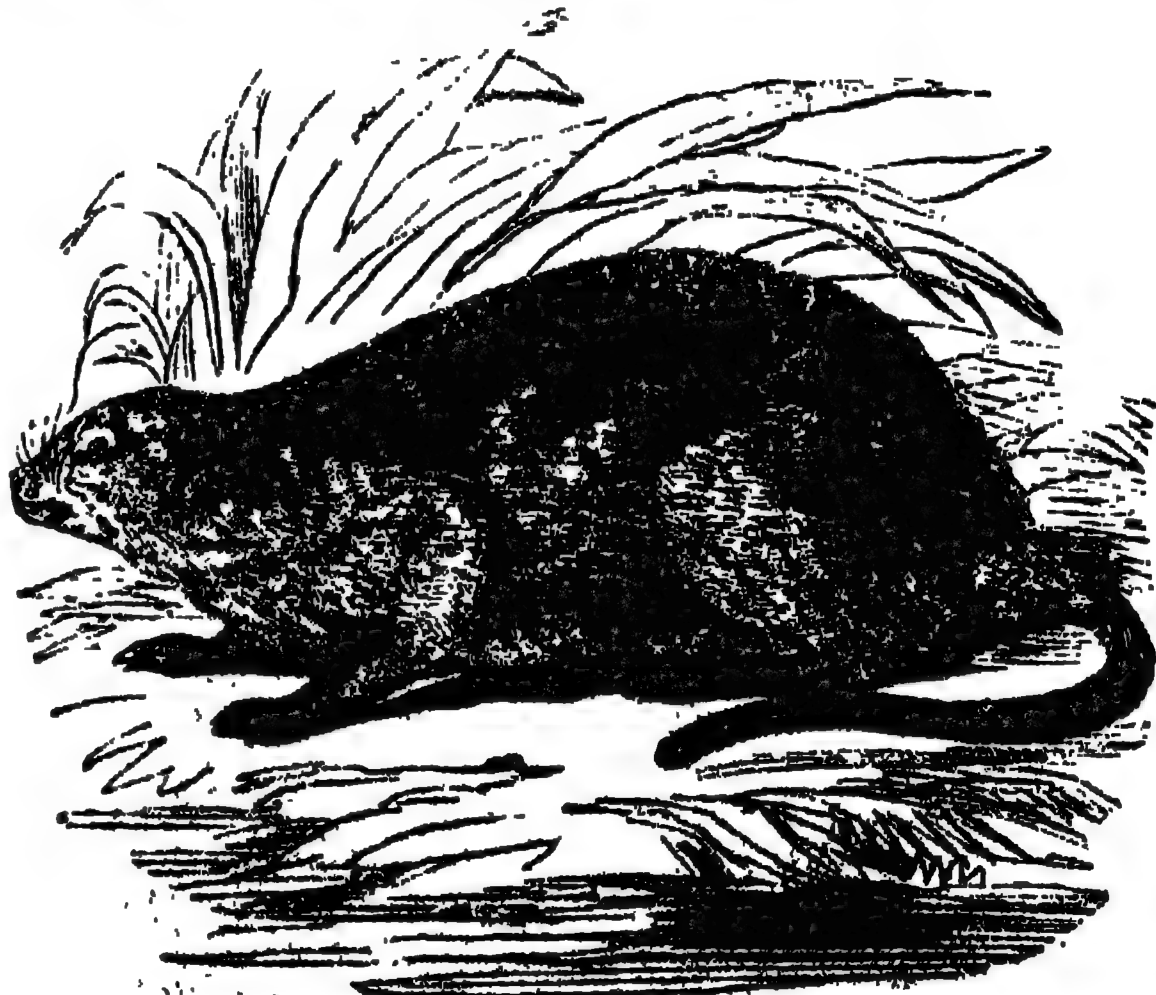
The habitations of the Musquashes and the mode of hunting them are thus described by the Doctor:—'In the autumn, before the shallow lakes and swamps freeze over, the Musquash builds its house of mud, giving it a conical form, and a sufficient base to raise the chamber above the water. The chosen spot is generally amongst long grass, which is incorporated with the walls of the house, from the mud being deposited amongst it, but the animal does not appear to make any kind of composition or mortar by tempering the mud and grass together. There is however a dry bed of grass deposited in the chamber. The entrance is under water. When ice forms over the surface of the swamp, the Musquash makes breathing-holes through it, and protects them from the frost by a covering of mud. In severe winters however these holes freeze up in spite of their coverings, and many of the animals die. It is to be remarked that the small grassy lakes selected by the Musquash for its residence are never so firmly frozen nor covered with such thick ice as deeper and clearer water. The Indians kill these animals by spearing them through the walls of their houses, making their approach with great caution, for the Musquashes take to the water when alarmed by a sound on the ice. An experienced hunter is so well acquainted with the direction of the chamber and the position in which its inmates lie, that he can transfix four or five at a time. As soon as, from the motion of the spear, it is evident that the animal is struck, the house is broken down and it is taken out. The principal seasons for taking the Musquash are, the autumn before the snow falls, and the spring, after it has disappeared, but while the ice is still entire. In the winter time the depth of snow prevents the houses and breathing-holes from being seen. One of the first operations of the hunter is to stop all the holes with the exception of one, at which he stations himself to spear the animals that have escaped being struck in their houses and come hither to breathe. In the summer the Musquash burrows in the banks of the lakes, making branched canals many yards in extent, and forming its nest in a chamber at the extremity, in which the young are brought forth. When its house is attacked in the autumn, it retreats to these passages, but in the spring they are frozen up. The Musquash is a watchful but not a very shy animal. It will come very near to a boat or canoe, but dives instantly on perceiving the flash of a gun. It may be frequently seen sitting on the shores of small muddy islands in a rounded form, and not easily to be distinguished from a piece of earth, until, on the approach of danger, it suddenly plunges into the water. In the act of diving, when surprised, it gives a smart blow to the water with its tail.'

Varieties.—Dr. Richardson records three varieties besides that above described.

1. The *Black Musquash*, rare.
2. The *Pied Musquash*, with dark, blackish-brown patches on a white ground.
3. The *White Musquash* (*Fiber Zibethicus-albus*, Sabine). This Albino is not unfrequent. Dr. Richardson saw several.

According to Hearne, the Musquash is easily tamed, soon becomes attached, and is cleanly and playful.

The fur is used in hat-making, and there is, according to Dr. Richardson, an annual importation of between four and five hundred thousand into Great Britain from North America for that manufacture. Charlevoix also notices the employment of the fur in the hat trade.



The Musquash.

MUSSCHENBROEK, PETER VAN, was born at Leyden, March 14th, 1692. He received a good classical education in the university of his native city, being a pupil of Perizonius and Gronovius, and afterwards applied himself to the study of medicine, which science, as well as those of chemistry and natural philosophy, he studied under Senguerd, Bidloo, Le Clerc, Burmann, Albinus, Boerhaave, and Rau. He was excessively fond of the mathematical sciences. In 1717 he formed an intimacy with the celebrated s'Gravesande, and their tastes being similar, they pursued their studies together. The introduction into Holland of the Newtonian system of philosophy, and the science of experimental physics, was principally owing to the labours of these two men. They worked together with equal zeal and success, but in different paths; s'Gravesande took the mathematical or theoretical part of physics, while Musschenbroeck applied himself more particularly to experimental physics, in which he excelled, and in which he made a great many discoveries.

On the occasion of taking his degree of doctor of medicine, in 1718, Musschenbroek wrote an inaugural dissertation, 'De aëris praesentia in humoribus animalium;' a very

clever production, which contains a description of many careful experiments, from which accurate conclusions were drawn, and, though published more than a century ago, it may still be read with interest. The author showed in this dissertation both a fondness and talent for experimental philosophy, and he was luckily placed under favourable circumstances for the development of this talent. At the commencement of his career the speculations of Descartes were rapidly dissipating before the lights of the Newtonian philosophy, but they still retained some supporters; Musschenbroek therefore determined to visit England, for the purpose of seeing Newton and making himself fully acquainted with his system. While in London, he was introduced to Dr. Desaguliers, and other scientific men besides Newton; and on his return to Holland, he soon came into public notice. In 1719 he was appointed professor of philosophy and mathematics, and professor extraordinary of medicine in the university of Doesburg on the Rhine, where he gained great reputation by his lectures. In 1723 he was invited to fill the chair of philosophy and mathematics in the university of Utrecht, which had been long distinguished as a school for legal studies, and which Musschenbroek soon rendered equally well known in the department of natural philosophy. He remained at Utrecht many years, and this city was the seat of his principal labours. The curators of the university were so fully impressed with the importance of keeping his services, that they conferred on him, in 1732, the professorship of astronomy. In 1737 George II. of England, elector of Hanover, offered to Musschenbroek a professorship in the newly established university of Göttingen. The offer was refused, but two years afterwards he accepted the professorship of mathematics in his native city, Leyden, which had become vacant by the death of Wittichius. Musschenbroek remained attached to the university of Leyden for the remainder of his life, though he was successively invited to fill other appointments by the kings of Prussia and Spain, and by the emperor of Russia. He died on the 19th of September, 1761, in the seventieth year of his age.

The following are Musschenbroek's principal works:—

1, 'Epitome elementorum physico-mathematicorum,' 12mo., Leyden, 1726. This work went through several editions, each succeeding edition being considerably altered and improved. It was reprinted in 1734, under the altered title of 'Elementa Physicæ,' 8vo., Leyden. An English translation is mentioned as having been made of this work by Colson, in 1741, 2 vols. 8vo., but we have not been able to meet with it. The last edition of this work appeared after the death of the author in 1762, and was named 'Introductio ad Philosophiam Naturalem.' This edition is much more complete than either of the former, and contains a very good summary of all that was then known on natural philosophy. These three editions are often spoken of as distinct works, though it is only the titles that are different.

This introduction to natural philosophy (the last edition is here referred to, which is the most complete) contains many original researches, on the cohesion of bodies, on the phosphorescent properties which many substances acquire from exposure to light, and on various points in experimental physics. It also includes a much more complete table of specific gravities than had before been published, entirely formed from the author's own investigations. Rigaud de Lafond translated the 'Introductio ad Philosophiam' into French (1769, 3 vols.). This translation must not be confounded with another which appeared at an earlier date (1739) with the title of 'Essai de Physique,' which was translated by Dr. Massuet from a Dutch edition of the same work, published by Musschenbroek, which Dutch edition (containing many researches which were not included in the later Latin ones) was written in a popular style for the purpose, which it fully answered, of diffusing a taste for natural philosophy in Holland among those who were not acquainted with the learned languages.

2. The work which has gained the author most celebrity is his 'Physicæ Experimentales, et Geometricæ Dissertationes,' Leyden, 1729, 4to. This work consists of four treatises: one on the magnet, one on capillary attraction, one on the size of the earth, and one on the cohesion of bodies. All these dissertations contain many interesting researches and new experiments, which were conducted with great care. The labours of Musschenbroek on the power of cohesion between different bodies were very great; and he afterwards rendered his observations on this subject more complete in the introduction to natural philosophy mentioned above. He greatly extended the science of magnetism by his memoir in the present work, though he improved his knowledge at a later period respecting the laws of magnetic attraction, and in 1754 published,

3, 'Dissertatio Physica Experimentalis de Magnete,' 4to., Vienna.

4. In 1731 Musschenbroek published, at Leyden, in 4to., a Latin translation of the 'Saggi di Naturali Esperienze fatte nell' Accademia del Cimento,' which appeared at Florence in 1667. This work, valuable in itself, was rendered much more so in the translation by the numerous notes and additions of Musschenbroek, which contain an account of some new experiments on the dilatation of different bodies by heat, and also a description of a pyrometer which he had invented, and which was the first instrument of the kind which had been made.

Besides the above works Musschenbroek delivered several public orations, which have been published. He also wrote many papers on meteorology (a subject to which he paid considerable attention), some of which appeared in the 'Memoirs of the French Academy of Sciences,' and some in the 'Transactions of the Royal Society of London.' He published some observations on the Leyden phial, in the 'Memoirs of the French Academy of Sciences' for 1746; and a 'Dissertation on Barometers,' which was printed in the 'Memoirs of the Academy of St. Petersburg.'

MUSSELBURGH, an antient burgh of royalty in the parish of Inveresk and shire of Edinburgh. It is seated on the right bank of the Esk, near the confluence of that river with the Frith of Forth, and is about five miles east from the city of Edinburgh, with which communication is kept up by stage-coaches. The name is supposed to refer to a mussel-bank near the mouth of the Esk.

The monks of Dunfermline were the sole proprietors of all the territory comprised within the limits of the burgh, down to the time of the Reformation. After that event the property came into the possession of the king, James VI., by whom the lordship and royalty, together with the patronage of the church of Inveresk, were conferred upon his chancellor, Lord Thirlstane, from whom they have descended, by inheritance and purchase, to the family of Buccleuch, the present proprietors.

The high street is spacious, and contains many good houses, and the town is surrounded by gardens and villas. To the south is the suburb of Newbigging, which branches off to the church of Inveresk. On the opposite bank of the Esk is the suburb of Fisher-row, inhabited chiefly by fishermen, who supply the markets of Edinburgh during the greater part of the year. There is a stone pier, and the harbour, though small, is convenient. The management of the affairs of the town and suburbs is vested in a council of 18 members, of whom 10 are chosen from among the inhabitants of Musselburgh, and the rest from those of Fisher-row. The tanning of leather, making of sailcloth, hats, bricks, earthenware, &c., and the manufacture of fishing-nets by looms, constitute the principal business of the place. The salmon-fishery is carried on by 'stake-nets,' but is not very productive. A branch of the Commercial Bank of Edinburgh has been established, and elegant gas-works for the supply of the town have recently been erected.

Four bridges cross the Esk, two of which are of stone; the uppermost is of considerable antiquity; the new bridge is a handsome structure erected from a design by Rennie. In 1831 the population of the burgh and the rest of the parish of Inveresk was 8961. By the Reform Act, Musselburgh, Leith, and Portobello were erected into a parliamentary district which now returns one member.

For a description of Pinkie House, formerly the residence of the abbot of Dunfermline, and now the abode of Sir John Hope, bart., the reader is referred to Chambers's *Gazetteer of Scotland*, 8vo., 1832; from which, and the *Parliamentary Report on Scotch Burghs*, this notice is chiefly drawn. In the former work will be found many interesting particulars relative to the antiquities of the place and the historical events with which it is connected.

MUSSULMAN. [MOHAMMED.]

MUSTAPHA I., sultan of the Turks, succeeded, in 1617, his brother Ahmed I., but, a few months after, was deposed by the janizaries, who placed on the throne his nephew Othman. A few years later the janizaries revolted again, deposed Othman, put him to death, and recalled

Mustapha to the throne in 1622. Soon after a fresh revolt deposed him again, and he was taken to the castle of the Seven Towers, in 1623, where he was strangled some years afterwards. (Knolles; Rycaut.)

MUSTAPHA II., son of Mahomet IV., succeeded his uncle Ahmed II. in 1695. In the following year he defeated the Austrians at the battle of Temeswar, but was defeated in September, 1697, by Prince Eugene, near Zenta in Hungary. The seraskier in the mean time had reconquered Chios from the Venetians. By the peace of Carlowitz, in 1699, the sultan acknowledged the dominion of Venice over the Morea and several districts in Dalmatia, and gave up Azof to Russia, and Kaminiek to Poland.

Mustapha then withdrew to Adrianople, where he gave himself up to sensuality. His neglect of the public affairs caused a formidable revolt to break out in the capital, and the insurgents marched upon Adrianople, and at the same time offered the throne to Ahmed, Mustapha's brother, who took the title of Ahmed III. Mustapha died in confinement, it was reported by a natural death, six months after his deposition, in 1703.

MUSTAPHA III., son of Ahmed III., succeeded his cousin, Othman III., in 1757. He had been strictly confined in the seraglio ever since the deposition of his father in 1730, but after ascending the throne he showed considerable firmness of character, and effected several reforms in the administration. He engaged, in 1769, in an unlucky war against Russia, in which he lost the Crimea and Bessarabia, but did not live to see its termination. He died in 1774, and was succeeded by his brother, Abdul Hamid. His son Selim afterwards succeeded Abdul Hamid, in 1789. [SELIM III.]

MUSTAPHA IV., son of Abdul Hamid, was placed on the throne by the janizaries, who had deposed sultan Selim III., in May, 1807. Mustapha was ignorant, weak, and cruel, and a tool in the hands of the janizaries. Mustapha Bairactar, pasha of Rudshuk, and a friend of Selim, collected an army and marched to the rescue of his master. He entered Constantinople and attacked the seraglio, demanding that Selim should be restored to him. Mustapha gave him up, but it was only the dead body of Selim, for he had been strangled by order of Mustapha at the approach of his deliverers. Bairactar deposed Mustapha, and placed his brother Mahmood on the throne, in July, 1808. In the following November a revolt of the janizaries broke out, which lasted three days, and a great part of Constantinople was burnt down. Bairactar, Mahmood's grand-vizier, perished in the flames; and the janizaries, being triumphant, were shouting for the deposed Mustapha when Mahmood gave orders to put his brother to death. Mahmood was now the sole remaining prince of the Ottoman dynasty, and the janizaries submitted to him, after making their own conditions. A vivid account of these fearful transactions is given by Macfarlane in his 'Constantinople in 1828.'

MUSTARD. [SINAPI.]

MUSTE'LA. [WEASELS.]

MUSTE'LIDÆ. [WEASELS.]

MUSU'RUS, MARCUS, a native of the island of Candia, emigrated to Venice about the end of the fifteenth century, and taught Greek in that city with great success. He edited several Greek works, which were printed by Aldus Manutius. Afterwards he proceeded to Rome, where Leo X. showed him great favour, and nominated him bishop of Epidaurus in the Morea. He died at Rome in 1517. He published the first edition of Athenæus, printed by Aldus, Venice, 1514. Musurus published also the 'Etymologicum Magnum Græcum,' folio, Venice, 1499, reprinted in 1549, in 1594, and 1710; and some Greek epigrams and other poetry, among others a poem in praise of Plato, which he prefixed to his edition of that philosopher's works, and which was translated into Latin verse by Zenobio Acciaioli, 'Carmen in Platonem,' Cambridge, 1797.

MUTE. [DEAF AND DUMB.]

MU'TINA. [MODENA.]

MUTINY ACT is a series of regulations which, from year to year, are enacted by the British legislature for the government of the military force of the country.

Laws have, at various times, been made by the authority of the crown for the maintenance of discipline in the army when in garrison, on a march, and in the presence of an enemy; these have been briefly hinted at in the article on Military Law, and may be seen at length in Grose's 'History of the English Army' (vol. ii.); but the code which is now in use is one of the first-fruits of the Revolution in 1688. Previously to that event the crown, except during the civil wars and the subsequent protectorate, had, at least practically, the supreme power over the militia (that is, over the whole military force), which, with or without the consent of the nation, might be called out and employed as long as pay and quarters could be obtained for the troops. But the efforts then recently made to carry on a series of measures tending to the maintenance and extension of arbitrary power in the crown, joined to the increasing jealousy of the people for their civil and religious liberties, led the two houses of parliament to take the earliest opportunity, after the new king had been called to the throne, of expressing in some public act of legislation their authority over the regular troops of the nation; and an opportunity almost immediately presented itself, on a serious act of mutiny taking place in the army. The Royal Scotch and Dumbarton's regiments, under Marshal Schomberg, in their progress to the coast for the purpose of being embarked for Holland, being quartered at Ipswich, a large body of men, refusing to proceed to their destination, disarmed their officers, seized the military chest, and, with four pieces of cannon, began their march for Scotland. Being pursued by General Ginckel, with three regiments of Dutch dragoons, they surrendered at discretion; but, in consequence of this event, and on the spur of the moment, a bill was passed (April 12th, 1689) by which the army was put at once under the control of the law with respect to discipline, and under its protection with respect to pay and quarters.

The enactments of this bill were particularly directed against the crimes of mutiny and desertion, for which the bill was immediately required; but the Act itself begins by laying down as maxims that the raising or keeping a standing army in the country in time of peace, unless it be with the consent of parliament, is against law; and that no man can be forejudged of life or limb, or subject to any kind of punishment in any other manner than according to the established laws of the realm. It then states that it is judged necessary, by their majesties and the parliament, during the present time of danger and for the defence of the Protestant religion, to continue and augment the forces which are now on foot. Avoiding the acknowledgment that any power exists in the crown for the appointment of courts-martial, it authorises their majesties to grant commissions to general officers to assemble such courts for the purpose of trying and punishing such offences as mutiny and desertion. Provisions are also made that nothing in the Act shall exempt an officer or soldier from the ordinary processes of law; that it shall not concern the militia troops, and that it shall only continue in force till the 10th of November in the same year. The Act has ever since, with one exception, been annually renewed: after the bill which passed in April, 1697, for one year as usual, had expired, no other was passed till March, 1702; and, on a few occasions, the bill has been suffered to expire for several days before the following one received the royal assent.

The Mutiny Act has, with time, varied in many particulars from that which was first passed, but it has been uniform in all its principal points; such as the dependence of a standing army on the consent of parliament, and the subjection of military men to all the processes of ordinary law. Instead however of the original formula above-mentioned, by which the reason of keeping up a military force was expressed, the Act now asserts that it is judged necessary by the crown and parliament to continue a body of forces (the number being exactly specified) for the safety of the United Kingdom and the preservation of the balance of power in Europe. In all the Acts which passed down to the commencement of Queen Anne's reign the articles were few in number, and some of them were very ill defined; but, from that time, parliament seems to have intended to exercise a general legislative jurisdiction over the army. Many new articles were then inserted; others have since been added, as the want became apparent; and the Mutiny Act may now be considered as a good general code of law, in which are defined strictly but briefly all military offences of the higher class, and, as precisely as possible, nearly all those of minor importance. The military offences of the higher class, thirteen in number, consist in a commissioned or non-commissioned officer, or a soldier, exciting mutiny, or not using his best endeavours to suppress it; in misbehaving before an enemy; abandoning or deliver-

ing to the enemy any garrison, fortress, or post; compelling or using means to induce the governor of such garrison to do so; quitting his post without leave, or sleeping at his post; holding correspondence with the enemy, or entering into terms with the enemy without licence; striking a superior officer, or disobeying his lawful commands; and, finally, in deserting the service. For all these offences the Act prescribes 'death, or such other punishment as a general court-martial shall award.' A clause of the Act enumerates the military offences of minor importance which may be tried before a district or garrison court-martial: these consist in a non-commissioned officer or soldier wilfully maiming himself, or tampering with his eyes; malingering, or feigning disease; stealing government stores; stealing from an officer or a comrade; procuring false accounts; embezzling public money; and, lastly, in any fraudulent or disgraceful conduct. For these offences may be awarded corporeal punishment, imprisonment, forfeiture of the additional pay to which, for length of service, the individual might be entitled, and forfeiture of pension on being discharged. And in another clause it is stated that imprisonment, with or without hard labour, or solitary confinement, may be awarded by regimental courts-martial for drunkenness, or insubordination on parade or on the line of march.

Besides the above laws, which relate particularly to the discipline of the army, the Act defines the constitution and powers of courts-martial; it contains clauses relating to the enlistment of recruits, the issue of pay and marching money, the quartering of soldiers, and the supplying of carriages for the conveyance of troops and baggage. The Act moreover contains a repetition of the original clause in which it is declared that the ordinary course of law is not to be interfered with when a soldier is accused of a capital crime; and it states that a man cannot be taken from the service for a debt under 30*l*.

The Mutiny Act is declared to be applicable to all persons employed in the recruiting-service; to the forces of the East India Company while in any part of the United Kingdom, and till their arrival in the territories of the Company; to the officers and men employed in the service of the artillery and engineers; to the corps of sappers and miners; to the military surveyors and draughtsmen in the ordnance department; and to foreign troops serving in any part of the British dominions abroad. Its provisions are also stated to extend to the islands of Guernsey, Jersey, Alderney, Sark, and Man. In one of the clauses it is expressly mentioned that nothing in the act extends to any of the militia forces, or yeomanry, or volunteer corps in Great Britain or Ireland; it is understood however that its provisions are applicable to the corps of marines when on shore, and also to officers holding rank by brevet, though not to such as are on half-pay. An effort was made in 1749, when the bill was introduced as usual into parliament, to subject officers of this class to martial law, but the clause was abandoned by the minister. Before the union of Ireland with Great Britain there was a separate Mutiny Act for the former country, but now the same act applies to both. The officers and troops of the East India Company are subject to their own Mutiny Act, which however agrees exactly with that of the government forces.

Previously to the year 1750 the members of courts-martial were bound by an oath not to disclose the ground on which they gave their votes; but in that year the act was so far mitigated as to release them from such oath when required to give evidence in any court of justice or court-martial. The power of disclosing, in that case only, the votes or opinions given is implied in the forms of the oaths which are now taken by the judge-advocate and members of the court-martial, and which are printed among the schedules to which the act refers. The act of the same year also contains a clause, in which it is stated that no sentence pronounced by a court-martial, and signed by the president, shall be more than once revised; previously to that time a general-officer had power to order the revisal of any sentence as often as he pleased, and thus he might retain in confinement a man who had been acquitted on a fair trial.

The gradual extension of the provisions of the Mutiny Act to those military offences which may be considered as secondary in the scale does not seem to have been noticed on behalf of the crown further than by the occasional reservation of its right to make Articles of War for the better government of the forces, which is expressed in the acts passed during the reign of Queen Anne. In the first year of George I. this right of the crown was formally allowed; and the clause containing it has been repeated in all subsequent mutiny acts, with the provision that no person within the United Kingdom and British Isles shall be subject to transportation, or to any punishment affecting life or limb, for crimes specified in the Articles of War, except such as by the Mutiny Act itself are liable to the same punishments.

The Articles of War which are at present in force, and which have from time to time been promulgated, are divided into twenty-four sections. Many of these correspond exactly to clauses in the Mutiny Act; others, though relating to subjects in the latter, define the particulars of the crime and the punishment applicable to it with more precision; and there are articles which have no counterparts in the act. The first section of the Articles of War relates to divine worship, frequent attendance on which is prescribed, and punishments are awarded for profaning the places in which it is celebrated, as also for scandalous or vicious behaviour in a chaplain. The seventh section contains fifteen articles relating to quarrels and the sending of challenges; and the fourteenth contains twenty-one articles concerning the duties of troops in quarters or in the field. Many of these articles prescribe for the offence 'death, or such other punishment as a court-martial may award;' and two of them prescribe death, without leaving any discretion to the court. The first of the crimes here mentioned is that of doing violence to persons bringing provisions to the camp, and the other is that of ill-treating a person to whom a *safe conduct* has been granted; the army in both cases being on service in foreign parts. The fifteenth section settles the relative rank of officers in the regular army; and the twenty-second the rank of officers in the royal army and in that of the East India Company, when serving together. The twenty-third section appoints that officers and soldiers while employed on board any ships having a royal commission shall conform to the laws and regulations established for the government and discipline of the navy.

The above articles, being made by the crown as head of the army, or by the commander-in-chief, are to be obeyed as being the commands of a superior officer; but the writers on military law observe that the legality of the articles may itself become the subject of examination in a court-martial, whereas the Mutiny Act must be obeyed without inquiry. In this particular therefore the Articles of War are to be distinguished from the Act; and whatever case may occur the letter only of the law, as contained in the Act, must be followed in awarding the punishment due to a crime affecting life.

The bill on which are founded the Articles of War for the Navy was passed in the 22nd Geo. II., and this consolidated all the laws previously made for the government of the ships and vessels bearing royal commissions, as also of the forces at sea. Among the offences which in the Act constitute the crime of mutiny, are the running away with the ship, or with any ordnance, ammunition, or stores belonging to the same; neglect of duty, joining in or using means to produce any mutinous assemblage of persons, uttering mutinous or seditious words, or concealing any mutinous intention, and striking an officer or disobeying his lawful commands. Of the thirty-six articles, nine relate to crimes for which the punishment of death, without discretion in the court-martial, is awarded; and there are twelve to which are assigned 'death, or such other punishment as the nature and degree of the crime shall be found to deserve.' Two of these were originally in the former class, and the qualifying clause was added in the 19th Geo. III. Except this alteration, none has been made in the navy act since it was passed.

MUTTRA. [HINDUSTAN, vol. xii., p. 219.]

MUZARAB, *i.e.* a Christian living under the sway of the Arabs. Various etymologies have been assigned to this word. Some pretend that it comes from the two words *Musa* and *Arab*, and that it meant in the first instance those Christians who capitulated to Musa at the time of the Conquest, and was an epithet by which the Mohammedans of Spain designated the Christian population of their cities; others derive it from *Mixti-Arabes*, *i.e.* Christians mixed with the Arabs. The absurdity of these etymologies need not be dwelt upon. Musa granted no capitulation to the Christians of Spain in general; and if the

Arabs had wished to give a distinctive name to the Christians subject to their rule, it is not likely that they would have employed two Latin words to designate a people living under their sway and in the midst of them. The real derivation of the word *Muzarab* is the Arabic *Mustarab*, afterwards corrupted into *Muçarab*, which means a man who tries to imitate the Arabs, or to become one in his manners, language, and habits; and who, although knowing Arabic, speaks it like a foreigner. This name was given by the Moors of Spain to all Christians living under Moslem jurisdiction in Cordova, Seville, Granada, Toledo, and other large cities.

But the word Muzarab is better known to us as connected with the antient liturgy of the Goths, which governed the Spanish church down to the twelfth century, and was called 'Muzarabic office' (*Missal Muzárabe*), owing to its being preserved by the Muzarab Christians of Toledo during the time of their subjection to the Arabs. The fate of the Muzarabic liturgy is singular enough. Though involving the same doctrines, it differed widely from the other offices of the church; it also contained many hymns composed by St. Eugenius, St. Ildefonso, St. Julian, St. Leander, and other great luminaries of the Visigoths. To produce uniformity in this respect, and substitute the Roman for the Spanish missal, became the principal aim of the holy see. Early in the tenth century a legate arrived in the Peninsula from Rome, sent by John X.; but the report which he made on his return proved to be a favourable one, and by the decision of a council, held at Rome, in 924, the Muzarabic office was not only sanctioned, but even praised. Another attempt, made in 1064, under Alexander II., had a similar result. Again, in 1067, new legates were sent, with a positive injunction to insist on the abolition of the antient service; but the Spanish prelates resisting the innovation, the subject was laid before a council assembled at Mantua, and the Spanish missal was once more declared Catholic and orthodox. Still the holy see persisted in its object. No artifice or intrigue was spared; and the court of Castile was divided into two hostile factions, one in favour of and the other against the introduction of the Roman ritual. In the perplexity occasioned by this dispute the two parties resolved to leave the decision to the judgment of God, and the expedient adopted to discover the divine will was this: two wild bulls were procured, the one to represent the Roman, the other the Muzarabic ritual, and, in the presence of the king and the court, were matched against each other. After a bloody conflict, the *Muzarabic* remained victor. But this result did not deter Gregory VII. In 1087 the trial was repeated: a champion was chosen on each side, and the decision left to the fate of arms; but again victory was in favour of the antient liturgy. Fire was then tried, and both missals were cast into the flames; but, if we believe the archbishop Don Rodrigo, who was present at the ceremony, the success was still more signal; for no sooner did the Roman volume touch the fire, than it jumped out of the flames half burnt, while the Spanish remained for a considerable time in the midst of them without receiving the least injury. The object was at last gained by other means. Alfonso, the renowned conqueror of Toledo, was won over to the interests of Rome, and, after much trouble and difficulty, he prevailed on the prelates of the kingdom to receive the universal office; and from that moment the Muzarabic, although not publicly condemned, fell into disuse. There is however still a chapel in the cathedral of Toledo where mass is performed every day agreeably to the Muzarabic ritual. It was founded by Cardinal Ximenes de Cisneros.

(Aguirre and Catalani, *Collectio Magna Conciliorum*, tom. iv., p. 193, &c.; Masdeu, *Historia Critica*, lib. ii.; Mariana, *Historia General de España*, lib. ix., chap. xviii.; Flores, *España Sagrada*, tom. iii. p. 187; *Missale Gothicum secundum Regulam Beati Isidori Hispalensis*, Romæ, 1804.)

MYA. [PYLORIDEA.]

MYA'RIA, Lamarck's name for a family of Dimyarian conchifers, consisting of the genera *Mya* and *Anatina*. [PYLORIDEA.]

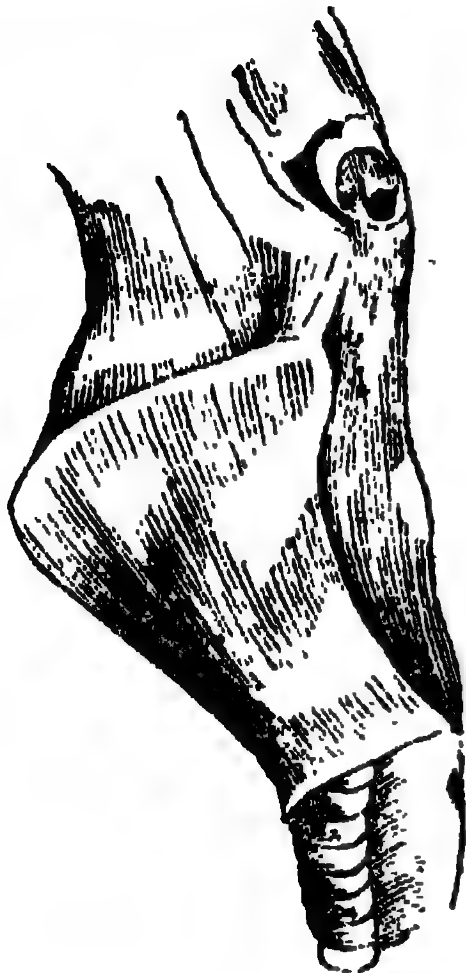
MYCALE. [IONIA.]

MYCE'NÆ, an antient town and state in Northern Peloponnesus, founded, it was said, by Perseus, and which in the time of its king Agamemnon was the most powerful state of Greece, ruling over the greater part of the Peloponnesus, besides many islands. [AGAMEMNON.] The small kingdom of Argos was then subject to Mycenæ. But after the death of Agamemnon and the extinction of the dynasty of Atreus, Argos gained the ascendency over Mycenæ, which however appears to have maintained a sort of independence, being protected by Sparta, with which Argos was often at variance. During the Persian war, Argos did not send any assistance to the Northern Greeks, but the contingent from Mycenæ was present at Thermopylæ. This added to the grudge which Argos bore against Mycenæ for its pride of antiquity and independence, and after the end of the Persian campaign, while Sparta was distracted by intestine commotion and afflicted by the consequences of an earthquake, the Argeii, being joined by the people of Tegea and Cleonæ, attacked Mycenæ, which they took after a stout resistance, and razed to the ground, B.C. 468. Part of the inhabitants were made slaves; the rest emigrated to Ceryneia, Cleonæ, and some even to Macedonia. (Diodorus, xi.; Herodotus; Pausanias.) Mycenæ never rose from its ruins, but these ruins, contrary to the assertion of Strabo (*Cas.*, 372–377), who evidently had not visited the spot, were, and still are, of considerable magnitude, and very remarkable. In the time of Pausanias (ii., ch. 15, 16) they consisted of a great part of the walls, with the gate called that of the Lions, from lions being sculptured above it, said to be the work of the Cyclopes; the fountain called Perseia; and the subterraneous buildings of Atreus and his sons, in which their treasures were deposited. There were likewise to be seen the tombs of Atreus, Agamemnon, of his charioteer Eurymedon, of Electra, and others. 'But Clytemnestra and Ægisthus,' adds Pausanias, 'were interred at a little distance from the walls, being thought unworthy of burial where Agamemnon lay and those who were slain together with him.'

The ruins of Mycenæ have been visited in recent times, among others, by Lord Elgin, by Cockerell, Dodwell, and Leake. We extract from the latter an account of their present appearance. Mycenæ was built upon a rugged height in a recess between two commanding summits of the range of mountains which border the eastern side of the Argolic plain, about seven miles north by east of Argos. The Acropolis, the entire circuit of which is still seen, the ruined walls being in some places from 15 to 20 feet high, resembled many other fortresses in Greece, being built on the summit of a steep hill between two torrents. Its length is about 400 yards and its breadth about 200. The ground rises considerably within the enclosure; on the summit are the openings of subterraneous cisterns or granaries built of large irregular stones lined with plaster. It has a great gate at the north-west angle and a postern towards the north-east. The door-case is formed of two massive upright blocks of stone, covered with another which is 15 feet long, 4 feet wide, and 6 feet 7 inches high. Upon this stands a triangular stone of green basalt 12 feet long, 10 feet high, and 2 feet thick, upon the face of which are represented in bas-relief two lions standing on their hind legs, one on each side of a round pillar or altar upon which they rest their forepaws. The pillar becomes broader towards the top and is surmounted with a capital formed of a row of four circles enclosed between two parallel fillets. Below the Acropolis, in the direction of the modern village of Kharvati, are the Spiliá, or subterraneous chambers, known in the time of Pausanias by the name of the treasury of Atreus. The largest of these chambers, which is of a conical form, is about 50 feet in diameter at the base. The door-ways are ornamented with half-columns of a style resembling the Tuscan, and have some other peculiar ornaments, minutely described by Leake, who gives sections of the chambers, as well as a plan of the ruins of Mycenæ. (*Travels in the Morea*, vol. ii.) 'Nothing,' observes Leake, 'can more strongly show the extreme antiquity of the remains at Mycenæ than the singularity of some parts of them and their general dissimilarity to other Hellenic remains. We find nothing in Greece resembling the lions or the columns before the gate of the great Thesaurus, or the treasuries themselves. In the military part of the architecture there is not so remarkable a difference between the Cyclopean ruins and the other most antient ruins remaining in Greece. In the walls are found specimens of construction of various ages, but the later reparations are easily recognised from the oldest part, which is of the kind called Cyclopean; and with this exception, everything left at Mycenæ dates of the heroic ages. Notwithstanding this remote antiquity, the description of Pausanias shows that Mycenæ has undergone less change since he travelled than any place in Greece.'

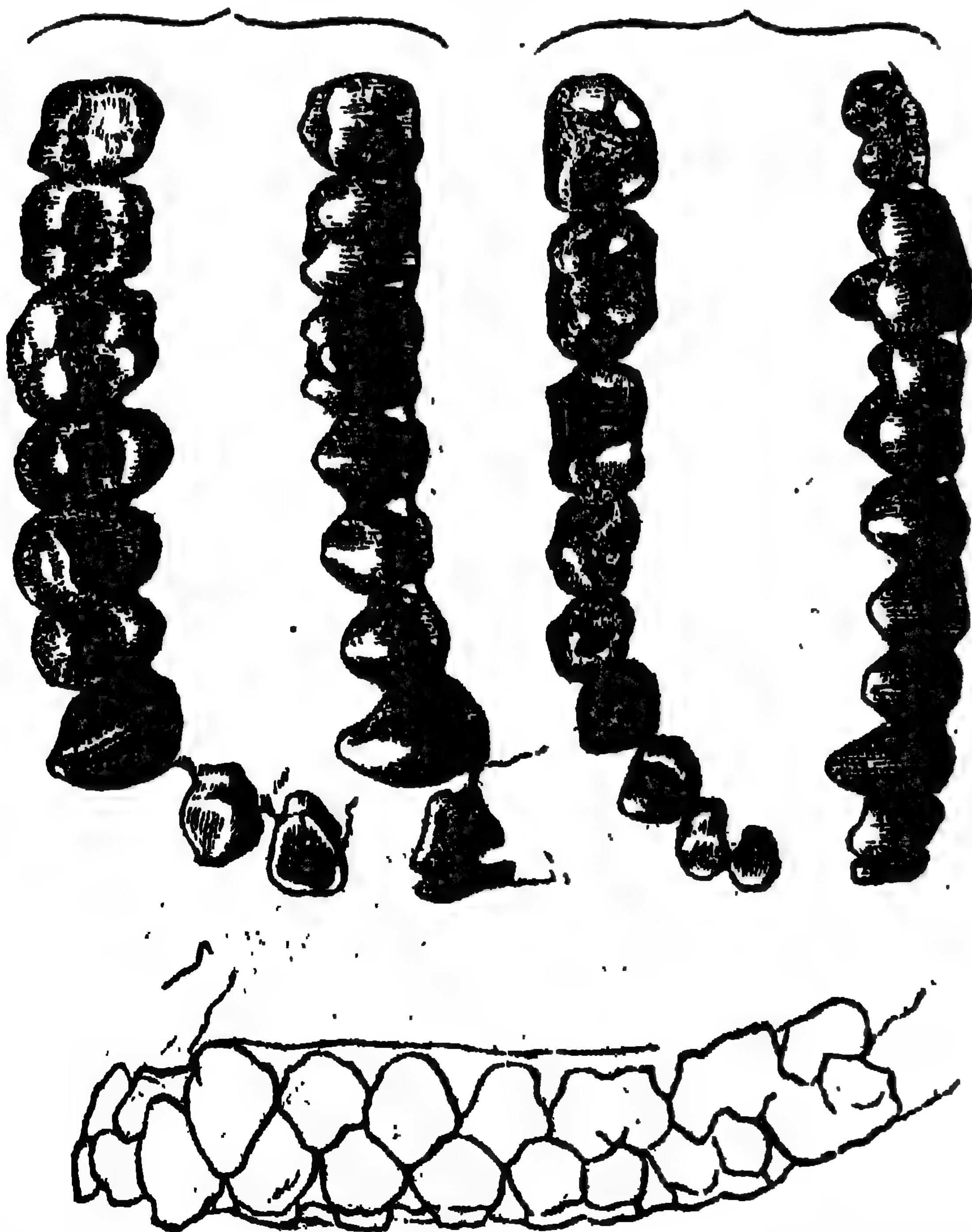
MYCETES, Illiger's name for a genus of *Quadrumana*, consisting of the largest monkeys of America, remarkable for the powerful development of the organ of the voice. The species are, as the name implies, *Howlers*, and the horrible yells sent forth by these animals from the depths of the forests are described by those who have heard the mournful sounds as surpassingly distressing and unearthly. Humboldt and Bonpland heard the *Araguato*, one of the species, at the distance of half a league.

The genus is distinguished by a pyramidal head with the upper jaw descending much lower than the *cranium*, while the lower has its ascending *rami* very high, to afford room for the bony drum formed by a convexity of the *os hyoïdes*, which communicates with the larynx, and gives to the voice the enormous volume above alluded to. Humboldt gives the following as the external form of the drum in this genus.



Drum of Howling Monkey

The tail in this genus is prehensile, and the part applied by the animal when laying hold of a branch or other body is naked below; so that such portion must have a higher sensibility of touch. M. F. Cuvier gives the following as the dentition of the Howling Monkeys, from the *Alouate fauve*.



Teeth of Howling Monkey. (F. Cuvier.)

Mr. Swainson (*Classification of Quadrupeds*) observes that it is rather singular that M. F. Cuvier should not have specially noticed the remarkable size of the canine teeth in the Howlers, which he says are uncommonly large; and adds that in a specimen before him when he wrote, they are nearly six times bigger than the cutting-teeth, a structure which at once separates this group from the genus *Cebus*. Facial angle about 30°.

Cuvier, in common with most other zoologists, places the genus at the head of the monkeys of the New Continent.

Mr. Gray (*Annals of Phil.*, 1825) places the form among the Anthropomorphous *Primates* in the second family (*Sariguidæ*), and as the sole genus of its first subfamily *Mycetina*.

M. Lesson arranges it between *Lagothrix* and *Cebus*.

Mr. Swainson makes *Mycetes* the first genus of the *Cebidæ*, the second family of his first order *Quadrumana*.

Mr. Ogilby observed in the summer of 1829 that two living individuals of *Mycetes seniculus* did not use the extremities of their anterior limbs for the purpose of holding objects between the finger and thumb, as is common among the *Quadrumana*; and he ascertained also on closer examination that the thumb, as it has generally been considered, was not in these animals opposable to the other fingers, but originated in the same line with them. Struck with the apparent singularity of the fact, he was induced to pay particular attention to all the other animals referred by zoologists to the Quadrumanous family to which he had access; and the continued observation of more than six years assured him that the non-opposable character of the inner finger of the anterior extremities, which he first observed in the specimens referred to, is not confined to the genus *Mycetes*, but extends throughout the whole of the genera of the South American monkeys, individuals of all of which had been seen by him in a living state. He remarked that a true thumb existed on the anterior limbs of none of them, and that consequently they have been incorrectly referred to the *Quadrumana* by zoologists generally. [Cheiropoda; Quadrumana; Simiadæ.]

The habits of these animals are social, and most of them have thick beards. Their deep and sonorous yells are supposed to be a call to their mates; in short, to be a hideous love-song. In their gregarious habits and howlings they may be considered as bearing some analogy to the Gibbons of the Old World [Ape, vol. ii., pp. 149, 150; Hylobates]; whilst their low facial angle has induced some to look upon them as representing the baboons of the antient continent.

Geographical Distribution of the Genus. — South America.

Example, *Mycetes Ursinus* (*Stentor Ursinus* of Geoffroy). The *Araguato*.



Mycetes Ursinus. Araguato.

Description, Habits, &c.—Length nearly three feet, without including the tail. Hair, which is longer than that of

Mycetes seniculus (*Mono colorado* of Humboldt), of a golden red, but the beard, which is of a deeper colour than the rest, is less bushy than it is in *M. seniculus;* and the circumference of the face where the hair is red is also paler. Humboldt states that the eye, voice, and gait denote melancholy. He saw young ones brought up in the Indian huts, which never played like the *Sagoins*. [JACCHUS.] Lopez de Gomara speaks of the *Araguato de los Cumanenses* as having the face of a man, the beard of a goat, and a grave demeanor. Fruit and the leaves of plants form their food. The females carry the young upon the shoulder. Humboldt counted above forty upon one tree, and he does not doubt that upon a square league of the wild countries frequented by them above two thousand may be found. They were in great abundance near pools of stagnant water shaded by the *Mauritia flexuosa*.

Localities, Brazil, Venezuela, &c.

MYCETO'PODA, or MYCE'TOPUS, a genus of conchifers with elongated valves, established by M. d'Orbigny, and referrible to the family NAIADÆ of Lamarck. M. d'Orbigny states that this genus perforates like the *Pholadæ*.

MY'CONOS, MICONI, one of the Cyclades, is situated east of Delos, from which it is separated by a narrow channel. It is about 10 miles in length and 6 in its greatest breadth. The island is mountainous and not very fertile: it produces some corn, wine, and cotton, but is deficient in wood. The population is about 4000, according to Thiersch. The men are good sailors, and the women are handsome. (Dapper, *Description des Isles de l'Archipel;* Spon; Porcacchi; Baudrand.) According to the antient fable, the Centaurs killed by Hercules were buried in this island, from whence came the proverb, 'to put all things under one Myconus,' applied to those who were apt to range under one class things naturally disparate. (Strabo, Casaub. 487.) The inhabitants, being poor in their own country, had the reputation of being parasites at other people's tables, and hence the proverb 'Myconian guests' for people who invited themselves. Miconi belongs now to the new kingdom of Greece.

MYCTE'RIA. [JABIRU.]

MYDA'US. [WEASELS.]

MY'GALE (Mammalogy). [SORECIDÆ.]

MYGDO'NIA. [MACEDONIA; MESOPOTAMIA.]

MYIAGRA. [MUSCICAPIDÆ.]

MY'LODON. [MEGATHERIIDÆ, vol. xv., p. 70.]

MYOCINCLA. [MERULIDÆ.]

MYO'PHONUS. [MERULIDÆ.]

MYOPORA'CEÆ are a natural order of plants, distinguished from Verbenaceæ by little except the ovules being pendulous and the albumen more abundant. The plants referred to Myoporaceæ are chiefly shrubs of little interest, inhabiting the Australian regions and other parts of the southern hemisphere. The most remarkable thing connected with them is the presence of cysts of oil in their leaves, which thence have a dotted structure. The White Mangrove, a shore plant rooting in mud, is a curious species. Brown describes its roots as creeping to a considerable distance, often curved above the ground as much as six feet before they fix themselves, and throwing up naked suckers out of the mud in great abundance, which look like shoots of asparagus.

MYOPO'TAMUS. [COYPOU.]

N.B. It is now ascertained that the Coypou *has* a *ligamentum teres*. In October, 1838, Mr. Owen exhibited to the Zoological Society of London a preparation of that ligament in the animal, which he had received from Mr. Otley of Exeter, and read the following extract in a letter from that gentleman:—

'I have enclosed with this the thigh-bone, and the *scapula, clavicle*, and *humerus* of a Coypou, which came into my hands after having been mangled by a stuffer of animals, and which had been preserved alive for some weeks by a gentleman of this place. I believe that not many opportunities have occurred of dissecting this animal in England; and as I found a difference between the specimen in question and that described by Mr. Martin, I thought the portions I have forwarded might be interesting to you, had it not fallen to you to dissect one of these animals. Mr. Martin states that the thigh-bone had no round ligament: you will see that there exists a well-developed one in this, as there also was on the other thigh-bone.'

Mr. Martin observed, that, on referring to his account of the dissection of this animal, it will be found that he is so far from asserting it as a fact positively determined, that the *ligamentum teres* is wanting; that, after giving an account of the state of the *acetabulum* and head of thigh-bones as he found them, he adds, 'It would be desirable that another specimen should be examined before this peculiarity (namely, the absence of a *ligamentum teres*) is insisted on as an ascertained fact.' (*Zool. Proc.*, 1838.)

Mr. Darwin (*Journal and Remarks*) notices this rodent as common among the broken islets of the Chonos Archipelago, where it exclusively frequents salt-water. The same author remarks that the *Capybara* or *Carpincho* [HYDROCHŒRUS] occasionally frequents the islands in the mouth of the Plata, where the water is quite salt, though it is far more abundant on the borders of fresh-water lakes and rivers.

MYOSO'REX. [SORICIDÆ.]

MYOTHE'RA. [MERULIDÆ.] Cuvier remarks that M. Vieillot has changed this name into *Myrmothera*.

MYOXUS. [MURIDÆ.]

MYRAFRA, Dr. Horsfield's name for a genus of birds arranged by Mr. Swainson as a subgenus of *Calendula*, in the subfamily of *Alaudinæ* of the family FRINGILLIDÆ.

MYRIAD (μυριάς), the Greek term for ten thousand, usually employed in our idiom for an indefinite but very large number.

MYRICA'CEÆ are plants constituting a very small natural order of apetalous Exogens, with separate sexes. The most essential part of their character is expressed by Endlicher in the following terms: 'Flowers unisexual. *Males:* Bractlets, 2; calyx, 0. *Females:* Hypogynous scales from 2 to 6; ovary one-celled, with 2 styles; ovule 1, erect, orthotropous; drupe one-seeded; seed erect; embryo without albumen; radicle superior.' In general their flowers are arranged in a manner similar to those of Betulaceæ and Salicaceæ, with which latter however they seem to have no real affinity. From Casuaraceæ, curious New Holland trees, with jointed leafless stems, like those of Equisetum, they are only distinguished by their erect ovule and orthotropous seeds. They are common in the temperate parts of the world, especially in North America and the Cape of Good Hope. With us the only species is the *Sweet Gale*, a common fragrant bush inhabiting wet commons. They are all more or less fragrant and aromatic; and one of them is called Myrica *cerifera*, or the wax-bearing, from the drupes being covered with a waxy secretion, which may be readily separated and manufactured into candles; whence has arisen its popular name of *Candleberry Myrtle*.



Myrica argata.

1, a male flower; 2, an ovary; 3, a drupe cut open vertically to show the erect position of the seed within it.

MYRI'STICA MOSCHA'TA, Thunberg (the M. officinalis of Linn., but not of Martius), a tree native of the Mo-

-ucca Islands, especially of Banda, but cultivated in Java, Sumatra, and elsewhere in the East, and lately in Cayenne and several of the West India Islands. It yields nutmegs and mace, the best of which are produced in the first-mentioned islands. The fruit is of the size and form of a peach, and, when ripe, the fleshy part separates into two nearly equal halves, exposing the kernel surrounded by an arillus, the former being the nutmeg, the latter the mace. The arillus is red when gathered, but being sprinkled with sea-water and dried, it assumes an orange-yellow colour. It has a fatty, shining appearance, yet is horny and brittle. The odour is strongly aromatic; the taste aromatic, but sharp and acrid. It contains both a fixed oil (in small quantity) and a volatile oil. One pound of mace yields by distillation one ounce of the latter. The former is not an article of European commerce, and what is termed the *expressed oil of mace* is obtained from the nutmeg, and should bear its name. An inferior mace is obtained from various species of Myristica, especially the M. tomentosa and M. officinalis (Martius), which is a Brazilian tree. The properties of mace are similar to those of the nutmeg.

On the removal of the mace is seen the shell, of an oval or ovate shape, and of a dark brown colour, in which is contained the seed or nut. This is closely invested by an inner shell or coat, which dips down into the substance of the albumen of the seed, and gives it the character which is termed *ruminated.* Two or three gatherings of the nutmegs are made in the year, generally in July and August, in December, and in April. The third period yields the best nutmegs. The collected nuts are dried in the sun or by the heat of a moderate fire, till the shells split: they are then sorted and dipped in lime-water, to preserve them from the attack of insects. The nuts are about an inch long, of the size of a hazel nut, but with a furrowed or sculptured surface. Those of good quality should be heavy, each weighing on an average 90 grains. The internal aspect is marbled and of a fatty appearance. The substance is grey, but the veins, which are of a reddish-brown, consist of cellular tissue abounding in oil, and are the processes of the internal coat already mentioned. Odour agreeable, strongly aromatic. Taste warm, aromatic, oily.

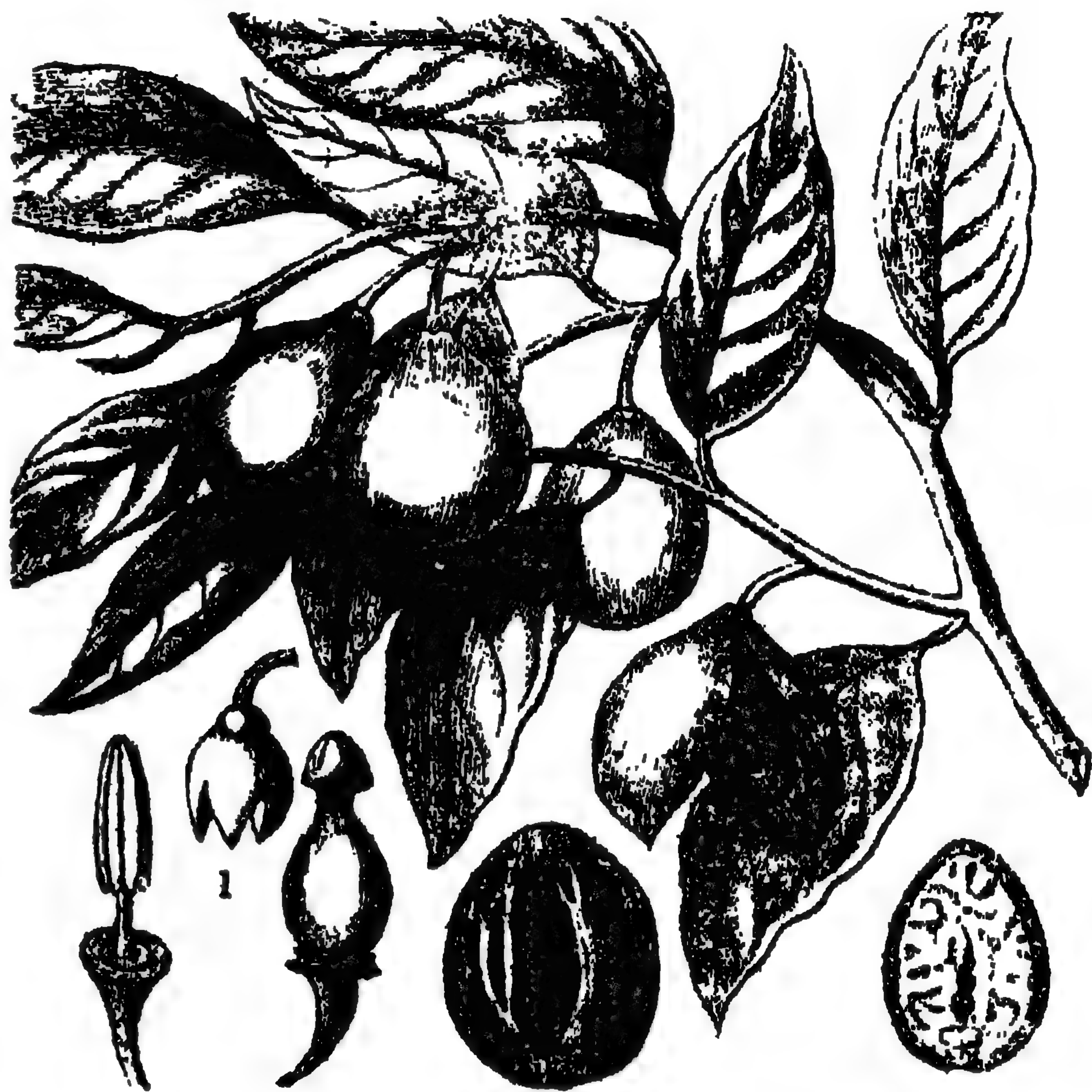
Besides the fixed oil, it contains a volatile oil, lighter than water, being of the specific gravity of 0·931-47, while a spurious oil of nutmeg is only 0·871. By keeping it deposits a stearopten, or Muscat-camphor, called *Myristicine.* The solid or fixed oil consists of stearine and elaine, with a slight portion of volatile oil intermixed. Both the fixed and volatile are used for medical purposes. Of the fixed there are two varieties, the English and Dutch, of which the former is the better. It occurs in pieces, wrapped in leaves of the banana, weighing about three-quarters of a pound. When cut into, it has a uniformly reddish-yellow colour. The Dutch sort is in larger pieces, wrapped sometimes in leaves, sometimes in paper, and of a lighter yellow colour. Both are frequently adulterated. The volatile oil is also mixed with purified oil of turpentine. Nutmegs are frequently either digested in alcohol or distilled to abstract the volatile oil, and then passed off as fresh. Such nutmegs are lighter, and, when a hot needle is inserted, do not give an oily coating to it. Old, worm-eaten, or wild nutmegs should be rejected. Genuine or cultivated nutmegs are called female, to distinguish them from the male or wild nutmegs, which are the produce either of the M. moschata, Var. sphenocarpa, or of M. tomentosa, Thunb. These are longer, heavier, weighing generally 110 grains, and of inferior quality. They are more apt to cause narcotic symptoms, giddiness, &c., than the true sort.

Nutmegs and mace, from the large quantity of volatile oil, are decidedly stimulant, and when used in abundance, produce, by exciting the circulation, narcotic effects. In moderation they promote the appetite and assist digestion. Either when grated, or when a few drops of the volatile oil are put on sugar, they relieve flatus and colicky pains. They are chiefly used as additions to other medicines, to quicken their action or cover their taste. They should be entirely abstained from by persons having a tendency to apoplexy. [Aromatics.] The fixed oil is employed externally as a rubefacient in rheumatism and other diseases.

MYRISTICA'CEÆ are tropical, fragrant, aromatic trees, with an astringent juice, alternate, coriaceous, simple leaves, without stipules, and diœcious flowers. Of the flowers the males have monadelphous stamens, the females a single one-celled ovary, containing an erect seed, and both have for calyx a tubular, coriaceous envelope, with from 2 to 4, usually 3, valvate teeth. Their fruit is a two-valved succulent capsule, containing a single seed enveloped in an aril, and consisting of ruminated albumen, abounding in a powerful and agreeable aromatic secretion; the embryo is very small, and placed in a cavity at the base of the albumen.

The order is nearly allied to *Anonaceæ*, from which however it differs very remarkably in the total want of a corolla, and in the reduction of the number of carpels to one. To station it in the artificial division of apetalous Exogens, as is usually done, is to violate every principle of natural classification.

The *Nutmeg* of the shops, which is the seed of *Myristica Moschata*, is the only product of the order employed officinally. [Myristica Moschata.] Other species bear fruit that may be employed as a substitute, but they are all inferior to the real oriental Myristica. Three genera of the order have been distinguished, namely, *Myristica*, inhabiting the tropical woods of Asia and America, with *Knema* and *Pyrrhosa*, both confined to the tropics of India.



Myristica Aromatica.

1, a calyx; 2, the monadelphous stamens of a male flower; 3, the pistil of a female flower; 4, the seed of the nutmeg, enveloped in the mace or aril; 5, a vertical section of the seed, showing the ruminated albumen and the small embryo at its base.

MYRMECO'BIUS. [Marsupialia, vol. xiv., p. 456.]

MYRMECO'PHAGA. [Ant-Eater.]

N.B. In November, 1831, a letter from Sir R. Ker Porter was read to the Zoological Society of London, giving a detailed description of the *Myrmecophaga jubata*, Linn., under the name of *Orso Hormeguero*, or *Ant-Bear*, accompanied by a drawing of the full-grown individual from which the description was taken. The writer was particularly struck with the difference in structure which exists between the fore and hinder feet, and with the curious disposition of the parts of the former in the act of progression, which has been slightly referred to by D'Azara. In the figure (in which the animal is represented in a standing position) the claws of the fore-feet do not project in front, but are doubled backwards under the wrist, evincing a mode of progression in the *Myrmecophagæ* similar to that described by Colonel Sykes as existing in the species of *Manis*. [Pangolin.] To receive the additional length and point of the middle toe, according to Sir R. Ker Porter, a protruding mass of hard flesh stood out from the wrist, wherein was a cavity destined for the reception of the ungulated elongation when the animal was in a standing position, and as, from the awkward formation of the fore-feet, quickness of motion becomes impossible, these animals may be caught in the smallest open space (when seen) with little difficulty.

Fossil Myrmecophagæ.

See the article Megatheriidæ, vol. xv., pp. 69, 72, and 73.

MYRMOTHE'RA. [Myothera.]

MYROSPERMUM, or *Myroxylon Peruiferum*, yields the balsam of Peru, and probably also the balsam of Tolu, though this is generally referred to *M. Toluiferum*. It is doubtful whether these are distinct species, or the same tree slightly differing, from circumstances connected with the place of growth. The two kinds of balsam are so similar that there is no difficulty in believing the differences between them to be owning to a difference of age in the individual trunk from which each was obtained, or to differences in the mode of extraction or of preparation.

Balsam of Peru occurs in two states; one called the white, the other the black. The former results either from spontaneous exudation from the bark, or from incisions made in it; it is also found in the inside of the seed-vessel wrapping the seed. At first it is liquid, of the consistence of recent honey, of a light-yellow colour, of an agreeable odour, resembling vanilla, and a somewhat acrid, bitterish, but aromatic taste. Its specific gravity is less than that of water. Heated in a platinum spoon it burns with a white smoke (which reddens litmus paper), and leaves no residual ash. It is completely soluble in alcohol, and also in æther, except some white material which separates from it. It contains much benzoic acid. By distillation with water it yields a volatile oil. By exposure to the air it hardens, and is then termed Opobalsamum siccum, which must not be confounded with the true Opobalsamum. [Balsamodendron.] Balsam of Tolu is also sometimes called Opobalsamum.

Black balsam of Peru is stated to be procured by boiling the resinous bark of the trunk and branches of the tree. Th. Martius conjectures that it is procured by subjecting these parts and the pods to a kind of dry distillation, or *distillatio per descensum*, similar to that by which tar is obtained from pine-trees. This balsam has the consistence of syrup, but does not solidify with age, is scarcely tenacious, of a blackish-brown colour, and not transparent, somewhat oily to the touch, odour agreeable, balsamic, resembling vanilla, taste acrid, balsamic, bitterish, and enduring. Scarcely igniting when in contact with flame; not yielding by distillation with water any volatile oil, and not perfectly soluble even in absolute alcohol. Its chief constituents are the oil, which cannot be termed volatile, two kinds of resin, and benzoic acid.

Both sorts are extensively adulterated, chiefly with turpentines, copaiva, or volatile oils. One test of genuine black balsam is, when 1000 parts of balsam saturate 75 parts of pure crystallized carbonate of potass.

Balsam of Tolu flows from incisions in the tree, and is of the consistence of a strong turpentine. It is sent to Europe in earthenware jars or tin cases. It becomes tenacious with age, and in cold weather may be fractured, but melts again in summer, or with the warmth of the hand. It is of a yellow or brownish colour, transparent, with the taste and odour of the white balsam of Peru. This balsam likewise is much adulterated. All the three forms possess the ordinary qualities of balsamic substances, and, either in the state of syrup or tincture, are employed where such medicines are indicated. These have been already detailed [Balsams], and it is only necessary to state here, that their fragrance renders them pleasant adjuncts to cough mixtures, when the acute or active stage is passed, while the difference of price is the only reason for preferring one kind to another.

MYRRH. [Balsamodendron.]

MYRSINA'CEÆ are chiefly subtropical plants of the Exogenous class, so nearly the same in their fructification as the Primulaceous species of northern climates, that scarcely any valid mark of distinction can be found between them. The indehiscent fruit in Myrsinaceæ is chiefly relied upon for the means of separating them. The general appearance of the two orders is however widely different; Primulaceæ consisting of herbs with no development of woody matter, while Myrsinaceæ, in all cases yet observed, are shrubs or trees. Many of the species have handsome foliage and gaily-coloured flowers, on which account they are frequently met with in gardens, but they are of no importance for useful purposes. Ardisia and Jacquinia are the two commonest genera.

MYRTA'CEÆ are polypetalous Exogens, forming a very extensive and important natural order of plants, exclusively inhabiting warm countries, and in all cases either shrubs or trees; an herbaceous form of the order is unknown. The most northern station of the species is the south of Europe, where the common Myrtle grows apparently wild. If this plant is taken as the type of the order, it might be said to consist of aromatic plants with opposite leaves, dotted with transparent oil-cysts, bearing icosandrous monogynous polypetalous flowers, succeeded by an inferior succulent fruit; but this is the character rather of a section of the order, than of Myrtaceæ considered as a whole. In this division are however included nearly all the species employed for the use of man. Among the table-fruits of the tropics are the *Guava*, yielded by different species of *Psidium*; the *Rose Apple* and *Jamrosade*, produced by *Eugenia Malaccensis* and *Jambos*; of spices, *Cloves* are the flower-buds of *Caryophyllus Aromaticus*; and *Allspice* is the dried berries of *Eugenia Pimenta*: all which are obtained from plants belonging to the same section as the common Myrtle; the aromatic fruits of that plant were indeed used as a spice before cloves and allspice became common.

The deviations that take place from the typical structure of the order consist partly in the fruit being dry and capsular, instead of fleshy and indehiscent, and partly in the organization of the interior of the fruit being reduced to a state of great simplicity; besides which the leaves are often alternate instead of opposite. Some of the species have no corolla, and there is in many cases a very singular tendency to consolidate the floral organs of all kinds.

The species with capsular fruit are principally found in New Holland, where, in the form of *Eucalyptus* and *Leptospermum*, they constitute one of the most striking features of the vegetation. [Eucalyptus.] These plants abound in a powerful astringent secretion, chiefly found in their bark, on which account they are found valuable for the tanner's purposes; while the aromatic principle is also abundantly secreted in other cases, as, for example, in *Melaleuca Cajeputi*, from which the green stimulating *oil Cajeput* is procured.

It is more particularly among these species that anomalous conditions of the floral organs occur. In *Eucalyptus* there is no corolla, and the segments of the calyx are so completely united to each other as to form a fleshy cap, thrown off by the flowers when the time arrives for extricating the stamens. In *Melaleuca*, *Calothamnus*, and several others, the stamens are united to each other by their filaments, so as to form showy, petal-like, fringed expansions; and in *Eudesmia* the petals themselves are united into a cap, thrown off upon the expansion of the flower.



Psidium pomiferum.
1, a flower; 2, a stamen; 3, a transverse section of the ovary.

The most singular form of Myrtaceæ is that which derives its name from a New Holland plant, called *Chamælaucium*, in which the interior of the ovary contains but one cell, with from two to five ovules rising up obliquely from its

base. These plants are all small heath-like shrubs, having in the majority of cases the edge of the petals prolonged into long and delicate fringes. Such plants are extremely abundant on the west coast of New Holland, where they form one of the most striking characters of the Flora.

The *Pomegranate*-tree is a most anomalous form of Myrtaceæ, remarkable for an almost total absence of transparent dotting, and consequently of aromatic qualities, and having a fruit consisting of two whorls of carpels, compacted together into an inferior ovary, the interior of which becomes altered and distended so much after the flower has fallen off, that the fruit is nothing but a collection of cavities filled with seeds, and having no apparent relation to each other.

MY'RTEA, Dr. Turton's name for a genus of conchifers founded on the *Venus spinifera* of authors.

MYRTLE, the *Myrtus communis* of botanists, is a bush with evergreen opposite leaves, which, when seen by transmitted light, appear as if pierced with small holes, in consequence of their containing a great number of little reservoirs of a transparent aromatic oil; the flowers are white, and produced in axillary clusters; they have an inferior ovary, numerous stamens growing from an epigynous disk, a single style, five petals, and are followed by a small oblong succulent fleshy purple fruit.

The Myrtle is apparently wild along the south coast of France, and in Sicily it occupies large tracts of country; but it does not appear to be really a European plant, but a native of Persia. In this country the Myrtle is seldom able to bear the winter, except when planted in front of a south wall, and protected from severe weather. In the Isle of Wight, some stations along the south coast of England, and in many of the mild parts of Ireland, it however becomes an ornamental bush, without requiring any protection whatever.

For a detailed account of the Myrtle, see Loudon's 'Arboretum Britannicum,' vol. ii., p. 962.

MYRTUS PIMENTO. [PIMENTO.]

MYSCA, Dr. Turton's name for a genus consisting of certain species of the genus *Unio*. Type *Unio Pictorum*.

MY'SIA, the name of an antient division of Asia Minor, forming the north-west extremity of that peninsula, and bounded on the north by the Propontis, on the west by the Hellespont and the Ægean Sea, on the south by Lydia, from which it was divided by the mountains which separate the valley of the Caicus from that of the Hermus, and on the east by the river Rhyndacus, which divided it from Bithynia. On the south-east the high land forming the interior of Mysia joins the central table-land of Phrygia towards the town of Azani. But the respective boundaries of Mysia, Bithynia, and Phrygia appear not to have been very clearly defined. (Strabo, b. xii.) Herodotus (vii. 74, 75) says that the Mysians were a Lydian colony; yet he adds, that the Bithynians affirmed that their ancestors had been driven from their former seat on the banks of the Strymon by the Teucrians and the Mysians. Strabo (vii., p. 295, Casaub.) says that the Mysi (Mœsians) and Getæ, who lived on the banks of the Ister, were considered by the old Greek writers to be Thracians, and that 'the Mysians of Asia, who dwelt between Phrygia, Lydia, and Troas, were a colony of the Mysians of Thrace.' [MŒSIA.] And in b. xii. he says that 'the Mysians of Asia were considered to be Lydians by some, and Thracians by others.' This may mean that Thracian immigrations became mixed with the previous inhabitants of Lydian race. Repeated Thracian immigrations are mentioned as having taken place before and after the Trojan war. Then came the Æolians, who occupied the maritime coast from the Hermus to the Æsepus, and built their cities there. [ÆOLIANS.] Geographers distinguished Æolia and Troas from Mysia. [TROAS.]

Mysia became subject to the Lydian monarchy, after the fall of which it formed part of one of the satrapies of the Persian empire which included also Lydia. It was afterwards in succession under the Macedonians, the kings of Pergamus, and the Romans. Under the Romans it formed part of the province called 'Asia.' Its principal towns were PERGAMUS, CYZICUS, ABYDOS, Lampsacus, Adramyttium, and Miletopolis, near the lake of the same name. The principal rivers of Mysia were the Caicus in the south and the Æsepus in the north; the smaller ones were the Evenus and the Granicus. The country now forms part of the Turkish province of Anadoli.

(Leake's *Asia Minor*; Charles Fellows, *Journal written during an Excursion in Asia Minor in* 1838, with an account of the remains of Assos and other towns of Mysia and Troas.)

MYSIS, the generic name for the *Opossum Shrimps*. [STOMAPODES.]

MYSORE, a large province in the southern part of the peninsula of India, lying between 11° 40′ and 15° N. lat., and between 75° and 78° 30′ E. long. Its greatest length from south-east to north-west is 210 miles, and its average breadth about 140 miles. The province is bounded on the east by the Eastern Ghauts, on the south by Coimbatore and Salem, on the west by the Western Ghauts, and on the north by the southern Maharatta country and districts formerly ceded to the English by the rajah of Mysore. The province consists of elevated table-land, with many lofty hills, among which rise several of the rivers that traverse the low countries; the chief of these rivers are the Caveri, the Vadavati, the Bhadri, the Arkanati, the Pennar, and the Palar or Palaur. The level of the province varies from 1830 to 2800 feet above the sea. Sevagunga, the highest mountain in Mysore, in 13° 10′ N. lat., 77° 20′ E. long., is 4600 feet high. Owing to the general elevation of the country, the climate is temperate and healthy. The clouds are much broken by the Ghauts which bound this territory to the east and west, and although there are frequent heavy showers in the table-land of Mysore, they are seldom of long continuance.

Mysore is governed by a native prince or rajah, with whom the English have a subsidiary treaty, concluded in 1799, after the defeat and death of Tippoo. On this occasion Coimbatore, Canara, and Soonda were transferred to the English government. The territory which remains to the Mysore rajah is divided into three districts or subayenas, viz. Patana or Seringapatam, Nagara or Bednore, and Chatracul. The first-named of these districts is by far the largest, and comprehends ninety one subdivisions; Nagara has nineteen, and Chatracul has thirteen subdivisions: each of these subdivisions is superintended by a soubahdar. The situation of the natives who are of the superior class is upon the whole much better in Mysore than it is in the British presidencies, because the whole administration, civil and military, rests with them, instead of being vested in Europeans. In the Company's territories the natives, whatever be their station, with only few exceptions, have a master in every European, while in Mysore the governing class owns only one master, the rajah. But the lower orders of the people are, on the contrary, by no means so well off as in the British territory, the Mysore government being most oppressive to them. The province is, upon the whole, thinly inhabited. In 1804, the latest time as to which we have any statement upon that subject, the number of families was 482,612, and of individuals 2,171,754. Several times during the latter half of the eighteenth century the country was overrun by hostile armies, and ravaged to such a degree that many districts, which had previously been well peopled, were wholly deserted. During the present century the inhabitants have enjoyed a greater degree of security, and several good roads have been opened. The dwellings of the peasants, although built of mud, are more neat and commodious than in most parts of India. The population is supposed to have increased since 1804 under the improved state of things.

The rajahs of Mysore were for many years actively opposed to the extension of the British power in India. Hyder Ali Khan, who began his military career in 1749, and who assumed the sovereign power in 1760, invaded the lower Carnatic in 1780, and desolated the country to the very gates of Madras. His further progress was arrested by Sir Eyre Coote, but, being assisted by the French, he was able to continue the war until December, 1782, when he died, and was succeeded by his son Tippoo, who continued the war until the beginning of 1784. Peace being then concluded between France and England, he lost the assistance of his European allies, and concluded a treaty with the English. In 1790 Tippoo attacked the rajah of Travancore, whom the English were by treaty bound to assist, and a war ensued, which lasted until March, 1792, when a peace was concluded by Lord Cornwallis under the walls of Seringapatam, by the terms of which Tippoo was deprived of nearly one-half of his dominions. With the hope of recovering this territory, he endeavoured in 1798 to excite disaffection among the native subjects of the British, and sought the alliance of the French republic and of the sovereign of Caubul. In February of the following year the British army entered Mysore, and in April laid siege to Seringapatam, which fortress was taken by storm on the 4th of May

when Tippoo was killed. Upon this event the English government placed on the throne the Maha Rajah Krishna Udiaver, then a child only six years old, a lineal descendant of the antient rajahs of Mysore, whose dynasty had been displaced by Hyder Ali. Purneah, who had been one of Tippoo's ministers, was at the same time entrusted with the government, and a treaty was concluded whereby the English undertook to maintain a military force for the defence of Mysore against all invaders, for which service an annual payment was to be made to the Company's government of seven lacs of pagodas (280,000*l.*). This treaty has continued in operation to the present time. The Rajah Krishna Udiaver, having been brought up under European guardianship, usually dispenses with much of the ceremony that is commonly observed at the courts of the native princes of India, but on state occasions he goes abroad with much pomp in a carriage capable of holding thirty persons, and drawn by elephants.

The town of Mysore, the antient capital of the province, was about 1770 superseded in this respect by Seringapatam, but it again became the seat of government on the fall of that fortress in 1799. It is situated in 12° 19′ N. lat. and 76° 42′ E. long. It occupies a considerable space of ground, and is enclosed by a wall. The streets are laid out with some regard to regularity, and the houses, which are for the most part whitened, are intermingled with temples and trees. The fort is separated from the pettah, or town, by an esplanade, and, besides the rajah's palace, contains the dwellings of the principal merchants and bankers.

MYSTERY (*μυστήριον*). In the religion of the Greeks there were rites and doctrines which were kept secret from the mass of the people and only communicated to a chosen few. These things were called *mysteries*. This word has been adopted by the writers of the New Testament, who apply it to things which are kept secret for a time and afterwards revealed, or to things which are kept secret from some persons though they may be revealed to others, or lastly, to things which, though not kept perfectly secret, are only made known by symbols. Thus the term answers pretty well to the English word *secret*. It is frequently opposed to words which imply *discovery*. Thus the New Testament writers speak of a *mystery revealed* (*μυστήριον ἀποκαλυφθὲν*) or *brought to light* (*φωτωθὲν*) or *made known* (*γνωρισθὲν*). They call the gospel a mystery, as being a system which had formerly been kept secret, but was now revealed to them, and through them to the world (*Rom.* xvi. 25, 26; 1 *Cor.* ii. 7-10; *Ephes.* iii. 9; vi. 19; *Coloss.* i. 26, 27; ii. 2; iv. 3). So Christ said to his disciples, 'To you it is given to know the mysteries of the kingdom of heaven, but to them it is not given' (*Matt.* xiii. 11; *Mark*, iv. 11; *Luke*, viii. 10), that is, you are permitted to understand those doctrines which are at present kept secret from others. But afterwards they were commanded to proclaim these secrets to the world (*Matt.* x. 26, 27; xxviii. 19, 20; *Mark*, iv. 22; xvi. 15; 1 *Cor.* iv. 1). It is also applied to individual facts or doctrines. Thus the admission of the Gentiles to the privileges of the Christian religion is called a mystery, because it had never before been understood by the Jews (*Rom.* xi. 25; *Ephes.* iii. 3-5). The fact that the living will undergo a change at the resurrection is also called a mystery (1 *Cor.* xv. 51). To the same class belongs the only passage in which the word might perhaps be understood to imply something not merely *unknown* but actually *incomprehensible*, namely, 1 *Tim.* iii. 16, 'Great is the mystery of godliness (or religion, *εὐσεβείας*); God was manifest in the flesh,' &c., which means, 'Great is the secret which our religion discloses—God was manifest in the flesh,' &c. In 2 *Thess.* ii. 7, 'the mystery of wickedness' is 'wickedness which is already *secretly* at work in the church,' and of which the *revelation* is predicted in ver. 8 (*τὸ γὰρ μυστήριον ἤδη ἐνεργεῖται τῆς ἀνομίας, ... καὶ τότε ἀποκαλυφθήσεται ὁ ἄνομος*). The word is used in rather a singular way, but still with the same meaning, in 1 *Cor.* xiv. 2, where it is said of a person who speaks in an unknown tongue, 'in the spirit he speaketh mysteries,' that is, he communes with God in language unintelligible to those around. We have examples of the use of the word to denote the secret meaning of a figure or symbol in *Ephes.* v. 2; *Rev.* i. 20; xvii. 5, 7. This general signification of *a secret* is the only one in which the word mystery is used in the New Testament. In the Septuagint its meaning is the same (*Daniel*, ii. 18, 19, 27, 28, 29, 30, 47; iv. 9). The early ecclesiastical writers applied the word to solemn religious rites, and this is probably the reason why *μυστήριον* is translated in the Vulgate by *sacramentum*. In modern usage a *mystery* is a doctrine which is incomprehensible by the human understanding, or which appears to involve facts irreconcileable with each other. Thus the doctrine of the Trinity, the union of the divine and human nature in the person of Christ, the consistency of God's perfect foreknowledge and fixed plan of providence with the free-will of man, are spoken of as mysteries. Not that these doctrines are considered as self-contradictory; for if such contradiction be proved, the doctrine is no longer mysterious but impossible. We believe that they can be explained, though our mental powers are not strong enough to explain them. It is worthy of remark that mysteries (in the modern sense) are found in philosophy and natural religion as well as in revealed religion.

(Campbell *On the Gospels,—Dissertation on the word μυστήριον.*)

MYSTERIES, or MIRACLE-PLAYS. [ENGLISH DRAMA, p. 426.]

MYSTICS, a Christian sect which arose in the second century, and whose principles are probably to be traced to the philosophy of the Christian Platonists of Alexandria, Ammonius Saccas and his followers. They first appear as a distinct sect in the fourth century, under the teaching of a Grecian fanatic, who gave himself out to be Dionysius the Areopagite, one of St. Paul's converts (*Acts*, xvii. 34), and who is generally regarded as the founder of the sect of the Mystics.

Adopting the Platonic doctrine, that the human soul is a portion of the divine nature, they held that every man has a divine light within him which is sufficient for his guidance to present and future happiness, but that this light is obscured by the grossness of our material bodies and by the influence of external objects. To shake off these evil influences, and thus to keep the soul in as close connection as possible with its divine original, they considered to be the essence of religion; and this they endeavoured to accomplish by constant meditation on spiritual objects, secret communion with God, and an austere discipline of the body. As they considered everything external to the soul as only calculated to obscure the divine light within, they set no value upon accurate systems of doctrine nor upon religious observances as contributing to the advancement of religion. One of their leading doctrines was that real love to God must necessarily be disinterested, that is, uninfluenced by the expectation of reward or punishment.

The austere lives and apparent devotion of the Mystics caused their principles to spread extensively in the Eastern church. In the ninth century they were introduced into the West by a present which the Grecian emperor Michael Balbus made to Louis le Debonnaire, of the works of Dionysius the Areopagite, which however are undoubtedly spurious. The book was translated into Latin by the order of Louis, and the principles contained in it soon found many followers. In the thirteenth century the Mystics were the most formidable opponents of the schoolmen, and gradually many eminent men who were disgusted with the puerile conceits and lifeless religion of the latter, attached themselves to the Mystics (among these may be mentioned Thomas-à-Kempis); and just before the Reformation, nearly all the friends of spiritual religion were included in this sect. In the seventeenth century the doctrines of Mysticism were advocated by a Spanish priest, Michael de Molinos, from whose representations of religion, as consisting in the perfect tranquillity of a mind always engaged in communion with God, the sect obtained the new name of *Quietists*. At the end of the same century attention was called to Mysticism in France by the writings of Madame Guyon, whose sentiments were opposed by Bossuet and defended by Fénélon.

(Mosheim's *Ecclesiastical History*, and the works quoted by him.)

MYTHO'LOGY (*μυθολογία*). The mythology of a people may be said to consist of those legends and traditions which have been, at some period or other, usually believed by the majority of the nation, but which cannot be regarded as historical truths on principles of sound criticism. The term therefore is not confined to the religious systems of the Pagan nations; it includes everything that has been an object of popular belief, not merely respecting the origin, attributes, and adventures of the gods, but also concerning the early heroes, migrations, and exploits of a people. The historical inquirer has frequently great difficulty in deter-

mining at what time the mythology of a nation may be said to cease, and its history to begin; and in fact it is impossible to determine the exact time, since the transition from mythology to history must be necessarily gradual; and many traditions, which appear at first sight entirely mythological, may, upon further examination, be proved to contain some great historical truths. The scepticism which calls upon us to reject as mythological everything in the early history of a people which appears to us extraordinary and unaccountable, is as little worthy of respect as the credulity which requires us to believe everything that has been recorded respecting the exploits and adventures of the early heroes of antiquity.

Though a mythological event may be fictitious, it appears that mythology differs from fiction or fable, in having been once generally believed by a people as an account of events which actually took place. That which is regarded by us as mythological, may therefore be considered by another people as an historical or religious truth; and in the same manner as the exploits and adventures of the gods and heroes in the Mahâbhârata and Râmâyana are viewed by us as mythological, so the exploits and adventures of the Israelites in the conquest of Canaan, in many respects as extraordinary and wonderful as those of the gods and heroes in the great Hindu poems, may be looked upon by the Brahmans as the mythology of the Christian religion.

On few subjects perhaps has more learning been thrown away, than in investigating the history and origin of the mythology of the principal nations of antiquity. Among the various theories that have been proposed on this subject, the four following appear to have met with the greatest number of supporters:—

1. *The Scriptural theory*, according to which all mythological legends are derived from the facts contained in the narratives of Scripture, though the real facts have been disguised and somewhat altered. The supporters of this theory maintain that all mythic personages may be found in the Scripture; that Deucalion is only another name for Noah, Hercules for Samson, Arion for Jonah, &c. This hypothesis has been supported with a profusion of learned ingenuity and absurdity by Jacob Bryant, in his 'Analysis of Antient Mythology,' who saw the patriarchs in every minute event of heathen mythology. Sir William Jones, in his dissertations, in the 'Asiatic Researches,' on the Hindu gods, applied Bryant's arguments to the Hindu mythology, though his good sense preserved him to a great extent from the follies which distinguish Bryant's work. Most of the Christian Fathers maintained that the principal deities in the antient mythology were in reality devils, and that their worship and history had been taught to mankind by the devils themselves. This theory has been adopted by Milton, in the first book of his 'Paradise Lost,' in those lines beginning with—

> 'First Moloch, horrid king, besmeared with blood
> Of human sacrifice, and parents' tears,' &c.

2. *The Historical theory*, according to which all the personages mentioned in mythology were once real human beings, and the legends and fabulous traditions relating to them are merely the additions and embellishments of later times. This mode of accounting for the origin of mythology appears to have been in some measure adopted by the Egyptian priests, and was maintained by many of the Greek writers. The Egyptian priests told Herodotus (ii. 144) that their deities originally reigned upon the earth, and that the last who reigned was Orus, the son of Osiris, whom the Greeks called Apollo. An instance of this mode of accounting for the origin of mythology may be seen in the explanation which the Egyptian priests gave to Herodotus of the myth respecting the foundation of the oracles of Dodona and Ammon, according to which the two black pigeons which came from Thebes, in Egypt, and commanded that the oracles should be established, were in reality two Egyptian priestesses, who had been carried away from Egypt by the Phœnicians, and brought respectively to Dodona and the Libyan desert. Livy also attempts, in a somewhat similar manner, to give an historical explanation of the myth respecting the suckling of Romulus and Remus by a she-wolf (i. 4).

The author of the 'Book of Wisdom' imagines that the heathen deities were originally human beings, and accounts for their becoming objects of religious adoration in the following manner: 'For a father afflicted with untimely mourning, when he hath made an image of his child soon taken away, now knoweth him as a god, which was then a dead man, and delivered to those that were under him ceremonies and sacrifices.—Whom man could not know in presence, because they dwelt far off, they took the counterfeit of his visage from far, and made an express image of a king, whom they honoured, to the end that by this their forwardness they might flatter him that was absent, as if he were present' (xiv. 15, 17).

Among the Greeks this theory was adopted by Ephorus, and was carried to a great length by Euhemerus, in his 'Sacred History' (ἱερὰ Ἀναγραφή), fragments of which have been preserved by Diodorus Siculus and Eusebius. Some of the Christian fathers also adopted this view of mythology, and employed it with considerable success in their controversies with the supporters of the Pagan religion. Among the moderns this theory has been maintained by Banier, in his 'Mythology and Fables explained by History.'

3. *The Allegorical theory*, according to which all the myths of the antients were allegorical and symbolical, and contained some moral, religious, or philosophical truth, which was originally represented under the form of an allegory, but became, in process of time, to be understood literally. This view of mythology was first introduced into Greece by the Sophists, and an example of it is given by Protagoras in his explanation of the myth of Prometheus. (Plato, *Protagor.*) In later times this view of mythology was adopted by the New Platonists in their controversies with the Christians; and their object was to show that the antient mythology, under the garb of allegory, taught all the important duties and doctrines of morality and religion. Thus the view of mythology given by Homer and Hesiod, which was considered by Plato, in his dialogues on the Republic, as mischievous and dangerous, because it attributed human passions and feelings to the gods, occasioned no difficulty with the later Platonists. There is a work of Proclus, of which the curious in such matters may find a translation in the first volume of Taylor's translation of Plato, written for the express purpose of proving, in opposition to Plato, that the mythology of Homer and Hesiod contained nothing contrary to sound principles of morality and religion, since the myths of these poets ought to be understood allegorically.

This method of interpreting the antient mythology has found much favour among modern writers. It has been adopted by Bacon, in his 'Wisdom of the Antients,' in which he observes, 'I freely and willingly confess that I am inclined to the opinion, that not a few of the fables of the antient poets contained from their very origin a hidden mystery and allegory. For who can be so obstinately blind to evidence, that, when he hears that after the extermination of the giants, Fame was brought forth as a posthumous sister to them, he does not immediately apply the story to those party murmurs and seditious rumours which are wont to spread themselves among a people for awhile after the suppression of rebellions. Or when he hears that the giant Typhon cut away and carried off the sinews of Jupiter, and that they were stolen from him, and restored to Jupiter by Mercury; how can he but perceive immediately that this is to be referred to powerful rebellions, by which the sinews of kings, their revenue and authority, are cut out; yet not so but that by mildness of address and wisdom of edicts, as it were by stolen means, the minds of subjects within a short time are reconciled and the power of kings restored to them. Or when he hears that in that memorable expedition of the gods against the giants, the ass of Silenus became by his braying an instrument of great value in dispersing these giants; must he not clearly see that this was imagined of those vast projects of rebels, which are mostly dissipated by light rumours and vain consternation? There is also another not unimportant indication of the existence of a hidden and involved sense; namely, that some of the fables are so absurd and senseless in their outward narration, that they seem to show their nature at first sight, and cry for exposition by means of a parable. Above all, one consideration has been of great weight and importance with me— that most of the fables of mythology appear by no means to have been invented by those who relate them, such as Homer, Hesiod, and the rest; for were it clearly made manifest to us that they proceeded from that age, and those authors by whom they are celebrated, and thence transmitted to us, we should surely, I conjecture, not have been induced to expect anything great or lofty from such an origin as this. But he who considers the subject more at-

tentively will discover that they are related to posterity as things already received and believed, not then for the first time imagined and offered to mankind. And this it is which has increased their estimation in my eyes, as being neither discovered by the poets themselves, nor belonging to their age, but a kind of sacred relics, the light airs of better ages, which, passing through the traditions of earlier nations, have been breathed into the trumpets and pipes of these Grecians.'

This view of mythology has been adopted and carried out to a great extent by Creuzer, in his 'Symbolik und Mythologie der alten Völker, besonders der Griechen.'

4. *The Physical theory;* according to which the elements air, fire, water, &c. were originally the objects of religious adoration, and the principal deities were personifications of the powers of nature. Thus the antient mythology of the Hindus, as developed in the Vedas, personifies the elements and the planets, and differs essentially from the hero worship of later times. The transition from a personification of the elements to the notion of a supernatural being presiding over and governing the different objects of nature was easy and natural; and thus we find in the Greek and Italian mythology that the deities presiding over the sun, the moon, the sea, &c., and not the objects themselves, are the subjects of religious adoration. The Greeks, whose imagination was lively, peopled all nature with invisible beings, and supposed that every object in nature, from the sun and sea to the smallest fountain and rivulet, was under the care of some particular divinity. Wordsworth, in his 'Excursion,' has beautifully developed this view of Grecian mythology.

'In that fair clime, the lonely Herdsman, stretched
On the soft grass through half a summer's day,
With music lulled his indolent repose;
And, in some fit of weariness, if he,
When his own breath was silent, chanced to hear
A distant strain, far sweeter than the sounds
Which his poor skill could make, his fancy fetched
Even from the blazing chariot of the Sun
A beardless youth, who touched a golden lute,
And filled the illumined groves with ravishment.
The mighty Hunter, lifting up his eyes
Towards the crescent Moon, with grateful heart
Called on the lovely Wanderer who bestowed
That timely light to share his joyous sport:
And hence a beaming Goddess with her nymphs
Across the lawn and through the darksome grove
(Not unaccompanied with tuneful notes
By echo multiplied from rock or cave)
Swept in the storm of chase, as moon and stars
Glance rapidly along the clouded heaven
When winds are blowing strong. The Traveller slaked
His thirst from rill or gushing fount, and thanked
The Naiad. Sunbeams upon distant hills
Gliding apace, with shadows in their train,
Might, with small help from fancy, be transformed
Into fleet Oreads sporting visibly.
The Zephyrs, fanning, as they passed, their wings,
Lacked not for love fair objects whom they wooed
With gentle whisper. Withered boughs grotesque,
Stripped of their leaves and twigs by hoary age,
From depth of shaggy covert peeping forth
In the low vale, or on steep mountain-side;
And sometimes intermixed with stirring horns
Of the live deer, or goat's depending beard;
These were the lurking Satyrs, a wild brood
Of gamesome deities; or Pan himself,
The simple shepherd's awe-inspiring God.'

Almost all the theories that have been brought forward, either in antient or modern times, to account for the origin of mythology, may be classed under one of these four divisions; but not one of them taken by itself is sufficient to account for all the mythological traditions of a nation. The error of most writers on mythology consists in referring the origin of all myths to one common source; whereas the mythology of almost all nations has arisen from various and distinct sources. All the theories which have been mentioned above are true to a certain extent. Even that mode of interpretation which we have ventured to call the Scriptural theory, perhaps the most unsound and unsatisfactory of all, will serve to throw light upon some myths which would otherwise be unaccountable. For instance, the legends which we find in the mythology of almost every people, respecting a period in which the world was covered with water, can hardly be explained upon any other hypothesis than that such an event actually took place as is recorded in the Mosaic books. It would therefore be more correct to say that the mythology of a nation has arisen from all the causes which have been mentioned, rather than from any one in particular; but it must also be recollected that there are many myths the origin of which cannot be accounted for on any of the hypotheses that have been proposed. A great number of legends in all countries have arisen from the desire of man to account for those natural phenomena which he cannot understand; and not a few have had their rise from a similar desire of giving a reason for the names of places and persons. The 'Metamorphoses' of Ovid will supply numerous examples of such myths.

The preceding observations are only intended to give a general view of mythology, and of the principal systems which have been proposed in antient and modern times to account for its origin. The particular mythology of any nation must be acquired by aid of the articles in other parts of this work, such as BRAHMA, VISHNU, FAIRIES, HERO, GENII, JUPITER, JUNO, APOLLO, ARES, MARS, BELLONA, &c., and more particularly by the help of such works of reference as are enumerated below.

(*Scriptores Rerum Mythicarum*, edited by Bode; Bochart's *Phaleg* and *Canaan;* Rudbeck's *Atlantica;* Bacon, *On the Wisdom of the Antients;* Banier's *Mythology and Fables explained by History;* Bryant's *Analysis of Antient Mythology;* Sir W. Jones, *On the Gods of Greece, Italy, and India;* Moor's *Hindu Pantheon;* Coleman's *Mythology of the Hindus;* Rhode, *Ueber religiöse Bildung, Mythologie, und Philosophie der Hindus;* Creuzer's *Symbolik und Mythologie der alten Völker, besonders der Griechen;* K. O. Müller's *Prolegomena zu einer wissenschaftlichen Mythologie;* Buttmann's *Mythologus, oder Abhandlungen und Aufsätze über die Sagen der Griechen, Römer, und Hebräer;* Lobeck's *Aglaophamus, sive de Theologiæ Mysticæ Græcorum Causis;* Grimm's *Deutsche Mythologie.* The English reader may refer to Keightley's *Mythology of Antient Greece and Italy.*)

MYTILA'CEA. [MYTILIDÆ.]

MYTI'LIDÆ, a family of marine conchifers.

The Linnean genus *Mytilus*, as it was left by the author in his last edition of the 'Systema Naturæ,' was divided into three sections. The first, 'Parasitici, unguibus affixi,' consisted of those species which are affixed by unguicular appendages to Gorgoniæ and other submarine bodies, both organic and inorganic, such as *Mytili Crista Galli, Hyotis,* and *Frons,* which have been since restored to the genus *Ostrea.* The second, 'Plani s. compressi, ut plani appareant et subauriti,' consisted of the *Pearl-bearing Muscle,* 'Matrix perlarum,' under the name of *Mytilus margaritiferus,* now separated generically under the names of *Meleagrina* and *Margarita* [AVICULA; MALLEACEA; MARGARITACEA], and *Mytilus unguis,* a species, if it be one, not larger than the human nail. The third, 'Ventricosiusculi,' comprised not only the true *Mytili,* of which *Mytilus edulis, the Common Muscle,* may be considered as the type, but also the *Mytilus Lithophagus,* the *Modiolæ,* the true *Avicula* (*Mytilus Hirundo*), and the fresh-water muscles (*Anodon*). The generic definition of this heterogeneous assemblage was, 'Mytilus. The *animal* an ascidia? The *shell* bivalve, rough (rudis), most frequently affixed by a byssus. The *hinge* toothless, marked (distinctus) by an excavated, longitudinal, subulate line.' Linnæus placed this genus between *Anomia* and *Pinna.*

Authors soon perceived the necessity of a reform in this arrangement, and the position which the genus occupied in the systems of the leading malacologists of more modern date will be found in the article MALACOLOGY, vol. xiv., pp. 318, 319, 324.

The genus *Pinna* of Linnæus ends the '*Bivalvia, conchæ*' of that author.

Cuvier makes the *Mytilacés* the second family of his Testaceous Acephalous Mollusks. He characterises the family as having the mantle open in front, but with a separate aperture for the excrements, adding that all these bivalves have a foot serving the purpose of creeping, or at least to draw out, direct, and fix the byssus. They are, he states, in conclusion, known under the generic name of *Moules* (Muscles).

This family Cuvier subdivides into

I. The True or Marine Muscles (Moules propres ou Moules de mer. Mytilus, Linn.).

In this subdivision are placed *Mytilus* (Mytilus edulis and its congeners); *Modiola* (Lam.); and *Lithodomus* (Cuv.).

II. The Anodonts (*Anodontes*, Brug.), vulgarly Pond Muscles (Moules d'Etang).

III. Les Mulètes (Univ., Brug.), commonly called the Painters' Muscles, including *Hyria* and *Castalia*, Lamarck.

IV. Cardita. (Brug.)

V. Cypricardia. (Lam.)

VI. Les Coralliophages. (De Blainv.)

Venericardia he considers as differing but little from *Cardita*, and he observes that both the one and the other approach *Cardium* in general form and the direction of the ribs (côtes). He states his suspicions that this is the place for *Crassatella*.

This family is placed by Cuvier between the *Ostracés* and the *Camacées*.

The genus *Pinna* is placed by this zoologist between *Avicula* and *Arca*.

Lamarck characterised his *Mytilacées* as having the hinge with a sub-internal, marginal, linear, very entire ligament, occupying a great part of the anterior border, and the shell rarely foliated. In this family he places the genera *Modiola*, *Mytilus*, and Pinna.

M. Deshayes, in the last edition of Lamarck's work, allows that nearly all conchologists have admitted the family of *Mytilaceans* or *Mytilidæ*, either as it was constituted by Lamarck, or after having made it undergo some modifications of little importance. M. Deshayes remarks that he himself adopted it in the 'Encyclopédie,' having suppressed the genus *Modiola*, which, in his opinion, has not sufficient characters, and supplied its place by *Avicula*. But, setting aside all former opinion, M. Deshayes, in the last edition of Lamarck, enters into an examination whether the family ought to be preserved. The genus *Mytilus*, he observes, has always two adductor muscles, the anterior one very small, and the posterior much larger; the lobes of the mantle are united posteriorly at a single point, so that there exists but a solitary siphon for the anus. The aperture of the mouth is not papillose within. The *Modiolæ*, he continues, differ in nothing from the *Mytili*; their anterior muscle is indeed in some species rather larger, and the anterior extremity of the animal is a little prolonged beyond the *umbones*. These differences are, in his opinion, without importance, for we pass from one genus to the other by insensible gradations. In the genus *Pinna* we no longer find the mantle with a posterior commissure; consequently there is no anal siphon; there are two unequal muscles, and the mouth as well as the lips are covered internally with membranous papillæ. The ligament of the *Mytili* is external and convex, like that of the *Uniones* (Mulettes), &c.; that of the *Pinnæ* is very narrow, elongated over nearly the whole of the posterior border, and often covered with a delicate testaceous lamina, losing nearly all the characters of external ligaments. The *Aviculæ* have no anterior adductor muscles, but, like the *Pinnæ*, their mantle has no posterior commissure; the mouth is furnished with papillæ; the ligament has none of the characters of external ligaments, but is sunk in a superficial gutter, and takes all the characters of the ligaments of the *Ostraceans* and other *Monomyaria*. If, says M. Deshayes, in conclusion, a great value is attached to the existence of the siphons and their number, it is evident that, in following the rules laid down for classification, the *Mytili* should be separated from the *Pinnæ*, and that we ought to constitute from them two very approximating families. Between the *Pinnæ* and the *Aviculæ* there would seem to be more analogy than between the *Mytili* and *Pinnæ*. Nevertheless, in this last genus there are two adductor muscles, whilst in the *Aviculæ* there is but one. Then we ought to remember that the character resting upon the number of the muscles is very important, and if we here apply that character, we shall be led to make the *Aviculæ* a small family separate from the *Pinnæ*.

M. de Blainville thus characterises the *Mytilacea*, which he places between the *Margaritacea* and the *Arcacea* or *Polyodonta*. The genus *Avicula* among the *Margaritacea* thus immediately precedes the *Mytilacea*.

Character.—Mantle adhering towards the borders, slit throughout its inferior borders, with a distinct orifice for the anus, and an indication of the branchial orifice by the more considerable thickening of its posterior borders; a canaliculated, linguiform foot, with a byssus backwards at its base; two adductor muscles, the anterior of which is very small, besides the two pair of retractor muscles of the foot.

Shell regular, equivalve, often furnished with an epidermis, or corneous, with a toothless hinge, and a linear, dorsal ligament.

The genera placed in this family by M. de Blainville are *Mytilus*, with its subdivisions, and *Pinna*.

M. Rang gives the following as the characters of the family *Mytilacés*:—

Animal having the mantle open throughout its inferior part, and adhering towards the borders; a separate aperture behind for the excrements, forming very rarely a tube; the foot linguiform, canaliculated, and furnished with a byssus behind.

Shell rather delicate, generally with an epidermis, or corneous, equivalve, but very inequilateral; the hinge toothless; the ligament linear; anterior muscular impression very small; the posterior one rather large.

Marine (the genus *Mytilus* alone presents a species which is said to live in fresh water). (*Manuel*, &c.)

The genera arranged by M. Rang under this family are, *Mytilus*, with its subdivisions, including *Modiola*, *Lithodomus* (Cuv.), and *Pinna*.

Mr. G. B. Sowerby (*Genera*), after remarking that the Linnean genus *Mytilus*, on account of its principal character being its want of hinge teeth, consists of several forms that are widely distinct from each other, and which have well served as the types of several Lamarckian genera, such as *Avicula*, *Modiola*, *Anodon*, and others, in connection with the present genus, which deservedly retains the name of *Mytilus*, both on account of its form* and the priority of its claim, proceeds to observe that the other genera which have been united with it, but from which it appears necessary to distinguish it, because of a certain degree of general resemblance, are *Modiola* and *Lithodomus*: from *Anodon* and *Avicula*, together with Lamarck's *Meleagrina*, it is, he adds, obviously distinct; whilst one character, namely, the pointed terminal umbones, serves to distinguish it from *Modiola* and *Lithodomus*.

Mr. Garner, in his paper 'On the Anatomy of the Lamellibranchiate Conchifera' (*Zool. Trans.*, vol. ii), is disposed to regard the disposition and form of the *branchiæ* and *siphons* as being of great use in the classification of those animals; and he instances *Anomia*, *Pecten*, *Arca*, *Modiola*, *Unio*, &c., &c., as each having a particular disposition of the *branchiæ*, sac of the mantle, valves, *siphons*, &c., giving rise to particular modifications of the course of the aërating currents of water to the *branchiæ*. He observes that in the genera, some of which are above mentioned, no complete division of the sac of the mantle exists, while in *Solen Hiatella*, *Pholas*, &c., a different disposition takes place. With regard to the *Excretory system*, he found the oviduct distinct from the sac in *Modiola*, *Mytilus*, *Lithodomus*, &c., whilst in *Tellina*, *Cardium*, *Mactra*, *Pholas*, *Mya*, and most others, the *ova* are discharged into the excretory organs. With reference to the *Reproductive system*, Mr. Garner remarks that the ovaries of the *Lamellibranchiate Conchifera* differ much in their situation: sometimes they form distinct parts, sometimes they are found in the foot, sometimes they are ramified in the mantle, which last disposition is present in *Modiola*, *Anomia*, *Lithodomus*, *Hiatella*, and the like.

The same author in his 'Anatomical Classification of the Lamellibranchiata' (*loc. cit.*), thus arranges the genera *Mytilus*, *Modiola*, *Pinna*, *Lithodomus*, and *Unio*.

Mantle with a distinct anal orifice.	Foot small, byssiferous . . .	Anterior muscle small; retractile muscles of the foot numerous; byssus large . . .	Byssus divided to its base	MYTILUS.
			Byssus with a common corneous centre .	MODIOLA.
			Anus furnished with a long lingulate valve.	PINNA.
		Muscles equal, two pairs of retractile muscles only; byssus rudimentary . . .		LITHODOMUS.
	Foot large, not byssiferous			UNIO — Cardita, Hyria, &c.

Genera. Mytilus.

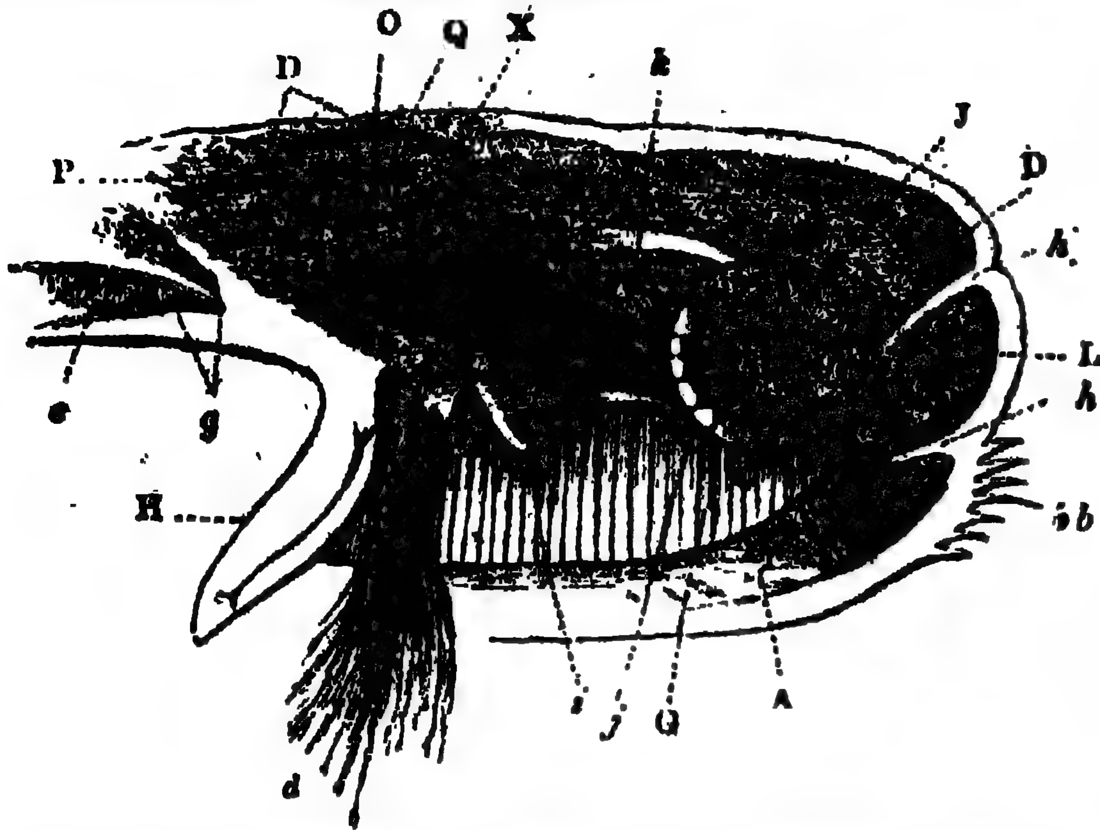
This genus is abundant on most rocky coasts, where the species are to be found moored by their coarse filamentous byssus, generally to such rocks or other submarine bodies as are exposed at some periods of the tide, where tides exist, and covered by the sea at high water. Mr. G. B. Sowerby does not think that, after being once attached, they habitually disengage themselves, though it appears to him probable that, when disengaged by the force of the sea, they may live for some time without being in any manner affixed.

M. Deshayes, in the last edition of Lamarck, thus describes the

Animal.—Oval, elongated; the lobes of the mantle simple or fringed, united posteriorly in a single point so as to

* The name is supposed to refer to the fancied resemblance between the shell of this Acephalan and a Mouse. The Greek word Μῦς is used to signify both a Mouse and a Muscle (Mytilus).

form an anal siphon; mouth rather large, furnished with two pairs of soft palps, which are pointed and fixed by their summit only. Foot slender, cylindraceous, carrying at its base, and posteriorly to it, a silky byssus; abdominal mass moderate, and on each side a pair of branchiæ nearly equal; two adductor muscles, the one anterior and very small, the other posterior, large, and rounded.



Gland of the byssus, mantle, oviduct, &c. of Mytilus edulis. (Garner.)

A, right lobe of the mantle; D, rectum; G, branchiæ; H, foot; J, posterior muscle; L, superior tube; O, heart; P, ventricle; Q, auricle; X, pericardium; b, tentacles; d, byssus; e, gland of the byssus; g, retractile muscle of the foot; h, valves of the mantle; i, oviduct; j, orifice of the excretory organ; k, internal ditto.

The species are numerous, and most of them are used as food; but they should be eaten with caution, for serious illness and even death have ensued from a meal made on some of them. The byssus or *beard*, as it is popularly called, should be carefully cleared away, and they should be particularly avoided when cholera is about, or even when diarrhœa is prevalent.

Captain P. P. King, R.N. (*Voyages of the Adventure and Beagle*, vol. i.), mentions the Choro (*Mytilus Choros* of Molina) as among those shell-fish of the island of Chilóe which are more particularly deserving of notice. Speaking of this large muscle, Captain King says, 'Molina has described the choro of Concepçion, which is not at all different from that of Chilóe. It is often found seven or eight inches long. The fish is as large as a goose's egg, and of a very rich flavour; there are two kinds, one of a dark brown, and the other of a yellow colour; but the last is most esteemed. There is also another sort, much larger than the choro, yet equally delicate and good, the fish of which is as large as a swan's egg: it is called cholgua; but as the shells seem to be of the same species, I think the distinction can only be owing to size. In Febres's "Dictionary of the Chileno language," the word cholchua is rendered into Spanish by "cascara de choros blancos," or shell of the white muscle. Cholhua, or Cholgua (the letters g and h are indiscriminately used), must be a corruption; for it is now used in Chilóe to distinguish the large from the small choros. The manner in which the natives of these islands, both Indians and descendants of foreigners, cook shell-fish is very similar to that used for baking in the South Sea Islands and on some parts of the coast of New Holland. A hole is dug in the ground, in which large smooth stones are laid, and upon them a fire is kindled. When they are sufficiently heated, the ashes are cleared away, and shell-fish are heaped upon the stones, and covered first with leaves or straw, and then with earth. The fish thus baked are exceedingly tender and good; and this mode of cooking them is very superior to any other, as they retain, within the shell, all their own juiciness.'

Geographical Distribution.—Very wide. Few rocky coasts are without some of the species, which are all littoral. They are sometimes found affixed to crustaceans, shells, and corals.

Mytili with a smooth shell.

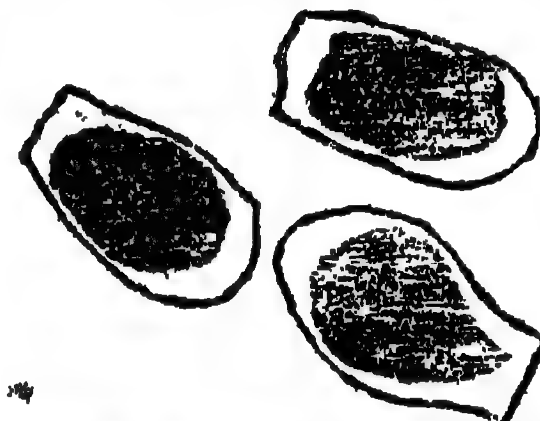
Example, *Mytilus edulis—Common Salt-water Muscle.*

This species is too well known to require description: the figures will show the shape of the shell, which is strong: when freed from the epidermis and polished, the under surface of the external part of the shell is exposed, and is of a deep blue. In this state it is often offered for sale at watering places. The inside of the valves is white with a dark rim.

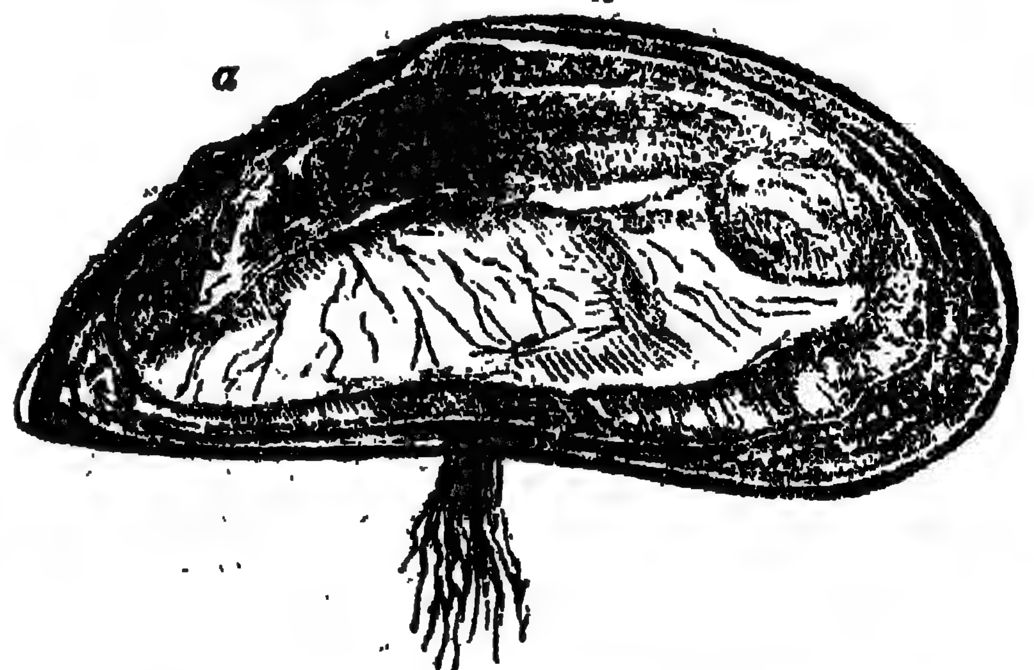
The common edible muscle is found in extensive beds below low-water mark, and also at a greater depth. Rocks and stones between high-water and low-water marks are also covered with them. We once saw a lobster, which is now, we believe, in one of our museums, with its shell coated with them. The species is used largely as an article of food, and is considered rich and sapid by many; but it entirely disagrees with some constitutions, and, besides other derangements, has been known to cause blotches, swellings, &c. Some cases are recorded where these and other affections have been produced by eating these muscles, whilst some who have partaken from the same dish have escaped all evil consequences. These derangements have been attributed by some to the byssus, by others to the Pea-crab [PINNOTHERIANS], a little crustacean which shelters itself, especially at particular seasons, in the shell of the Muscle, and by others again to the muscle itself being in an unwholesome state or out of season. There can be little doubt that the muscle, like the oyster, and indeed like most other edible animals, is comparatively unfit for the food of man at certain periods; but that the Pea-crab has anything to do *per se* with the poisonous qualities of these esculents is denied by all who have written on the subject. When any symptoms of derangement occur after eating muscles, an emetic should be taken and afterwards a dose of castor-oil. Cases of this kind are however rare. Pennant remarks, that for one who is affected by eating muscles, a hundred remain uninjured. [See further, MYTILUS EDULIS.]

Particular localities are celebrated as producing this muscle in perfection. 'Ne fraudentur gloriâ sua littora,' exclaims the author last quoted. 'I must, in justice to Lancashire, add, that the finest muscles are those called *Hambleton Hookers*, from a village in that county. They are taken out of the sea and placed in the river Weir, within reach of the tide, where they grow very fat and delicious.' In 'The Forme of Cury' (1390) is a receipt for dressing 'Muskels in brewet,' and also one for making 'Cawdel of Muskels.'

Small or seed pearls frequently occur in this species, and some years ago these were employed for medical purposes.



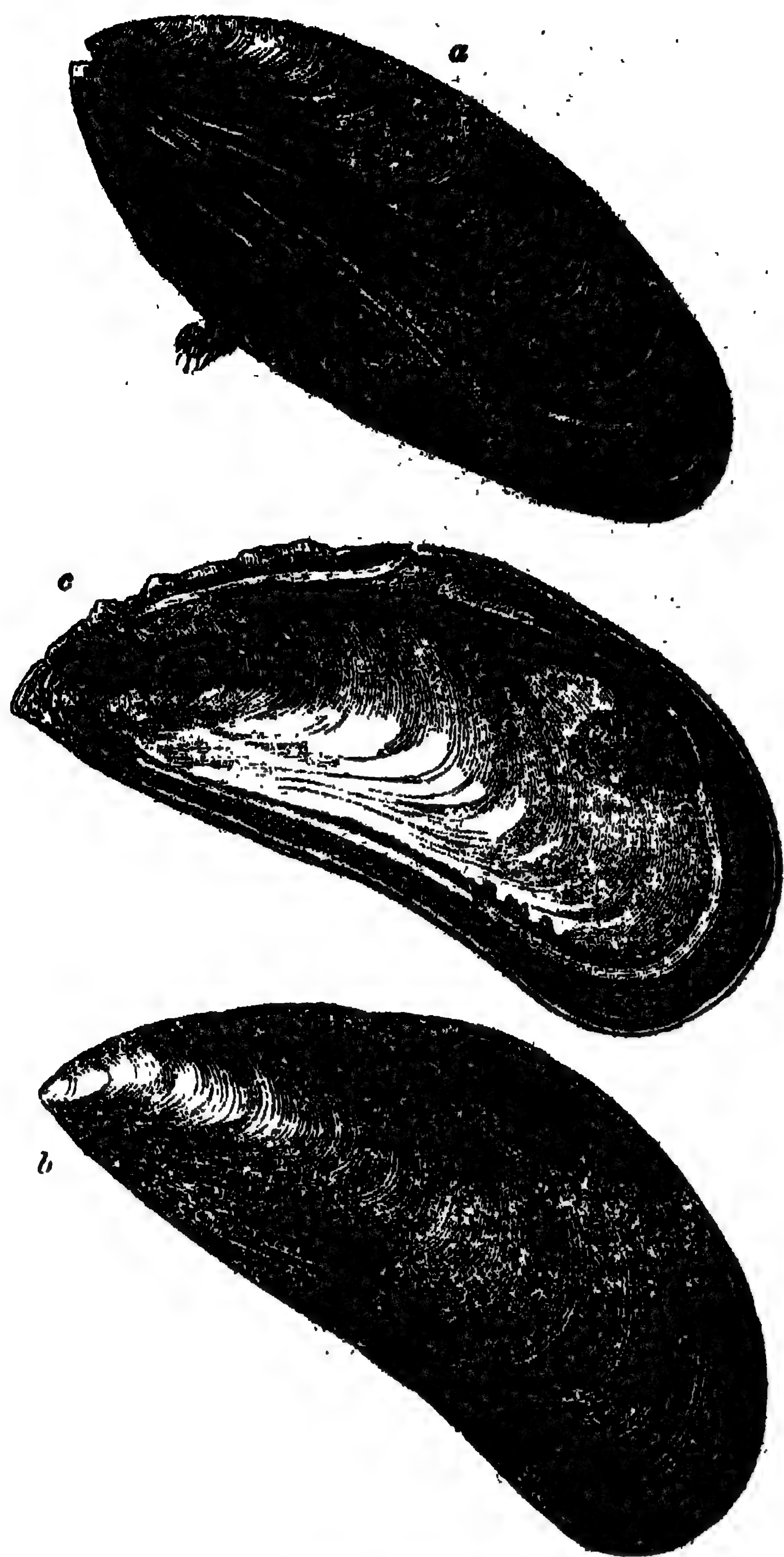
Ova of Mytilus edulis. ($\frac{1}{16}$ inch focus.)





Mytilus edulis.

a, detached valve;—the animal in situ with byssus;—the mantle slightly contracted; *b*. valves conjoined;—animal as seen when the shell is partly forced open, with byssus.



Shell of Mytilus edulis.

a, valves closed, with byssus; b, external view of one of the valves; c, internal view, showing the muscular impressions.

In the Museum of the Royal College of Surgeons (*Physiological Series*, No. 94) is one of the valves of this species, which has been steeped in an acid to dissolve and separate the earthy part (carbonate of lime) and show the animal part retaining the membranaceous form.

* *

Mytili with the shell striated longitudinally.

Example, *Mytilus Magellanicus.*

Description.—Shell oblong; whitish below, purple violet above, with long thick undulated furrows; the umbones acute, and not much curved. Length varying, generally from four to five inches.

Localities.—Straits of Magalhaens, Chilóe, &c.

The flesh is well-flavoured and nutritious. The shells of old individuals, when polished, are brilliant, with a nacreous deep purple tinged with violet.

It is not improbable that this species ministered in a degree to the woful wants of Byron and his wretched companions after the wreck of the *Wager*. 'Having thus established,' says that officer, 'some sort of settlement, we had the more leisure to look about us, and to make our researches with greater accuracy than we had before, after such supplies as the most desolate coasts are seldom unfurnished with. Accordingly we soon provided ourselves with some sea-fowl, and found limpets, muscles, and other shellfish in tolerable abundance; but this rummaging of the shore was now become extremely irksome to those who had any feeling, by the bodies of our drowned people thrown among the rocks, some of which were hideous spectacles, from the mangled condition they were in by the violent surf that drove in upon the coast. These horrors were overcome by the distresses of our people, who were even glad of the occasion of killing the gallinazo (the carrion crow of that country) while preying on these carcasses, in order to make a meal of them.'



Mytilus Magellanicus—attached to a rock by its byssus.

Here may be introduced the *Mytilus polymorphus* of Pallas, Gmelin, and others, thus characterised as a genus by Dr. Vanbeneden, under the name of

Dreissina.*

Animal.—Mantle entirely shut, presenting three apertures, one of which is furnished with a siphon. Anterior extremity of the body bifurcated and lodging in the middle of the division the transverse anterior muscle. Abdomen depressed; extremities of the branchiæ floating in their posterior half.

Shell.—Regular, equivalve, inequilateral, umbo with a septum in its interior. Three muscular impressions, the middle one unique and linear.

Nervous System.—This consists of two pairs of ganglions and a great single ganglion; they are all united together, and represent a true chaplet (chapelet). The first pair of nerves, that which represents the brain, is situated on the lateral parts of the buccal opening between the two labial tentacles, but more approximated to the anterior tentacle. It cannot be said that it is placed above the œsophagus, for it is, if anything, below it. The skin, which forms the upper wall of the œsophagus, covers it, and it is placed between this skin and the anterior retractor muscle. The second or mesial pair is situated at the anterior part of the base of the retractor muscle, between it and the liver. The third pair is represented by a single ganglion, which occupies the mesial line, and of which the volume is considerable. It is situated in the middle of the posterior transverse muscle.

The muscular system is much the same as in *Mytilus.*

Dr. Vanbeneden thinks that the organ of the byssus, which he designates, after Poli, by the name of 'languette,' has been erroneously taken for the foot. The true foot, he observes, consists of a muscular tunic more or less thick, which covers the abdomen of the animal, and serves it as an organ of progression; whilst the organ, which always accompanies the byssus, possesses no character in common with the foot except its mobility. Instead of covering the abdomen as a muscular tunic, it forms a part of the retractor muscle, from which it cannot be separated. At the base of this organ, with which, when the byssus is torn away, the animal seems to explore the bodies in its neighbourhood, is the sheath in which the byssus is lodged.

The mantle entirely envelops the animal, and forms three apertures, one of which serves for the passage of the byssus and the 'languette;' the second terminates the animal in the siphon; the third is placed on the back, and gives passage to the excrements. The aperture of the siphon is elongated many lines in respiration, and can be bent in different directions.

Place in the Animal Series.—Dr. Vanbeneden comes to the conclusion, from the anatomical and physiological

* Named from M. Dreissens of Maseyk (province of Limburg).

structure of the animal, that its place is between *Mytilus* and *Anodon*.

Geographical Distribution.—The author above quoted states that this form is found throughout Europe, and that America possesses individuals which approach it. (*Mytilus recurvus*, Rafinesque, &c.)

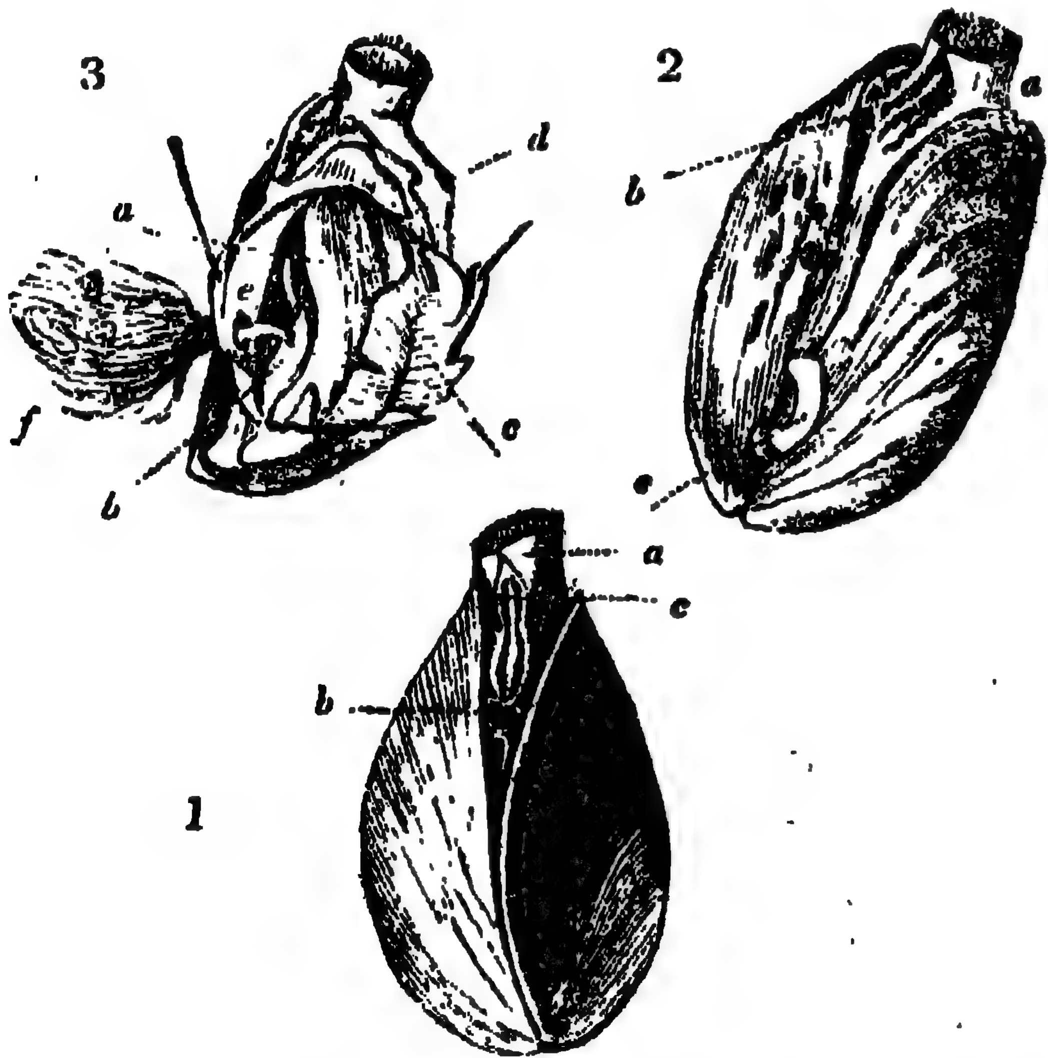
Dr. Vanbeneden records two recent species, *Dreissena polymorpha* and *Dreissena Africana*.

Example, *Dreissena polymorpha*. This appears to be the *Mitylus Wolgæ*, Chemn.; *M. Chemnitzii*, Fér.; *M. Hagenii*, De Baer; *M. lineatus*, Waardenburg, and *M. Arca*, Kickx.

Localities.—Inhabiting seas, lakes, rivers, and marshes; all these conditions seem favourable to it. Dr. Vanbeneden gives the following localities:—the Caspian Sea, the Black Sea, and the Baltic, the Danube, the Wolga, and the Rhine, where they are found in considerable quantities; the marshes of Syrmia (the Palatinate), the *Canal Guillaume* (Belgium), the lakes of Harlem (Holland), the Lea (our river Lea, we suppose, is meant), the *Doks* (the Commercial Docks, London, probably), and the neighbourhood of Edinburgh (Union Canal); so that this form extends nearly over the whole surface of Europe from lat. 43° N. to 56°; Turkey, Austria, Russia, Germany, Belgium, Holland, and England. (Vanbeneden.)

Mr. J. D. C. Sowerby appears to have been the first who noticed their introduction into the Commercial Docks, in the Thames, to which place he is of opinion that they had been probably brought in timber.

Habits, &c.—The species are found at the bottom of the water in beds, like the marine mytili, agglomerated in bunches by means of their byssus. They attach themselves to stones, to piles, to other shells (*Unio* and *Anodon*), and all the bodies which are in their neighbourhood. Dr. Vanbeneden remarks, in continuation, that they probably often adhere to the keels of boats, and that it is perhaps by such means that they are dispersed over such a considerable extent.



Dreissena polymorpha.

1, Animal of 'nat. size,' showing the siphon exserted, and the aperture which corresponds with the anus open; view of the back. *a*, The siphon; *b*, the posterior row of papillæ; *c*, anal aperture.

2, View of the ventral side. *a*, The siphon; *b*, the anterior row of papillæ; *c*, the languette.

3, Animal in the left valve. *a*, The abdomen; *b*, the languette in situ; *c*, the branchiæ; *d*, the aperture which gives issue to the excrements; *e*, aperture of the byssus; *f*, the byssus. (Vanbeneden.)



Shell of Dreissena polymorpha.

a, View of inside of valve, showing the septum at the umbo; *b*, the outside of valve.

M. Deshayes (last edition of Lamarck), after alluding to the memoir of Dr. Vanbeneden, which the reader will find in the second series of the *Annales des Sciences Naturelles*, vol. iii. (1835), allows that the animal does not entirely resemble the marine mytili, which have the mantle open nearly throughout its circumference, and only have the lobes united posteriorly in a single point, so as to form over against the anus a small canal for the issue of the excrements. The principal difference, he remarks, consists in the *Mytilus polymorphus* having two posterior apertures instead of one; the second aperture, larger than the other, prolonging itself into a short siphon destined to conduct the water over the branchiæ. With regard to the other parts, he observes that they do not differ from the other mytili except by gradations similar to those which are found in the marine species. Thus the retractor of the foot is here less divided, and leaves only a single narrow and isolated impression on the valves. M. Deshayes states that he knows an analogous disposition in the marine species. The form of the foot, the position of the byssus, the form of the mouth and of the labial palps, and the interior disposition of those organs, resemble the same parts in the mytili. Some slight differences may perhaps be found in the distribution of the nerves; but M. Deshayes inquires whether it is clearly made out that this distribution does not vary as much in the marine muscles. He then adverts to the small transverse septum in each valve, the external surface of which gives attachment to the anterior adductor muscle of the valves, and he allows that if this character was only to be found in this species, coexisting with two posterior apertures in the mantle, a small generic group might be founded on this type; but he proceeds to state that many marine species, *Mytilus bilocularis*, for example, offer the same character, which loses its importance when we find it established by degrees, commencing in some species so as to be scarcely perceptible, increasing in others, and showing itself in its greatest development in the species last quoted. Unfortunately, he adds, the animal of *Mytilus bilocularis* is not known; so that we are unable to appreciate the value of the character which it offers in common with the genus *Dreissena* of Dr. Vanbeneden.

Modiola. (Lamarck.)

M. Rang makes Modiola the third group of the genus *Mytilus*. M. Deshayes, in his inquiry whether this genus ought to be preserved, observes that the *Mytili* and *Modiolæ* much resemble each other, as all admit, but they offer some difference, the importance of which he proceeds to test. Of the animals he says nothing, their analogy being so perfect, and all their characters, internal as well as external, being so similar that it is impossible to distinguish them. The habit which certain species have of living in the stones which they pierce has not changed their organization; and of the justice of this remark those interested in the subject may, he states, assure themselves by a comparison of the animals themselves, which are abundantly spread abroad in all seas. It is a received principle among all zoologists, he continues, that animals having the same organization ought to make a part of the same genus; but as there are persons who attach considerable importance to certain characters in the shells, it is right to reduce it to its just value. The *Modiolæ* differ from the *Mytili* in not having pointed and terminal umbones. On assembling a great number of living and fossil species of both genera, some will be observed whose umbones, nearly terminal, are overpassed by a small very short border; others in which this border is a little more extended; and so one passes by insensible degrees from the *Mytili* to the *Modiolæ* without the possibility of determining the point where one genus ends and the other begins. If the same comparison is continued between the *Modiolæ* and the *Lithodomi* the same passage may be observed, and then, concludes M. Deshayes, the observer will be convinced, as we are, of the inutility of these genera.

Mr. G. B. Sowerby, in whose *Genera*, No. xxvi., will be found very instructive figures showing the variety of form to which the *Modiolæ*, treated by him as a distinct genus, are subject, admits that the most important character which serves to distinguish *Modiola* from *Mytilus* consists in the smaller side of the former advancing before the umbones, and giving the shell a rounded termination anteriorly. In every other respect he admits that it resembles *Mytilus*, to which it was united in most of the older books, in connection with other genera that are exceedingly distinct. 'The *Modiolæ*, like the *Mytili*,' says Mr. Sowerby, in continuation, 'and many other genera, affix themselves to submarine productions by means of a bundle of rather coarse fibres, commonly called a byssus, each fibre of which

is fastened to the rock by its expanded external termination, and applied by the foot of the animal. The recent species of *Modiola* are not very numerous; we have however several species on the coasts of Britain, of which the most remarkable are the *M. discrepans* and *discors*. These two, together with some others that resemble them in form, differ much from the common *Modiolæ*, and might perhaps with propriety be considered as a distinct genus.' The same author states his belief that *Modiolæ discrepans* and *discors* are, on our coasts, always found embedded in the common *Ascidia*, and appear to be destitute of a byssus; while the much larger specimens that are brought from the West Indies are found completely enveloped in a fine silky byssus closely matted together, and forming large bundles. Some cognate species however, that have been brought from the Northern Ocean, appear, he adds, to have been affixed by a few filaments only.

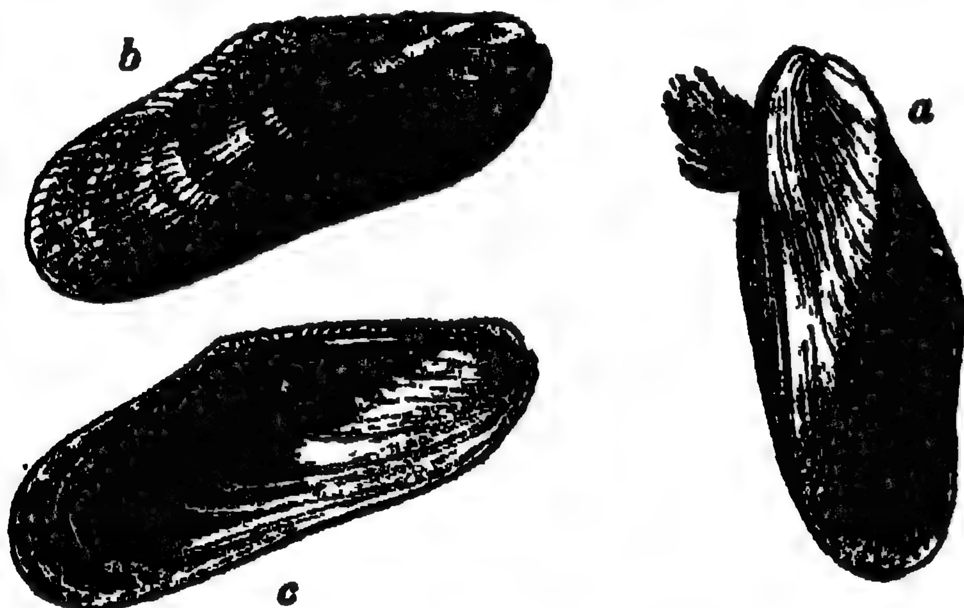
Mr. Garner remarks (*loc. cit.*) that when a foot is present there are three *ganglia*, or pairs of *ganglia*; when absent, but two. Two are situated at the mouth, more or less removed from each other, but always connected by a supra-œsophageal nerve; they are sometimes on a level with or before the mouth, sometimes behind it. They give off on each side filaments to the anterior muscle, tentacles, lips, and anterior part of the mantle. Each *ganglion* likewise gives off a twig going to the posterior *ganglia*, which are situated between the *branchiæ* on the posterior muscle. These are united into one, when the branchiæ are themselves united medianly, as in *Mactra*, *Mya*, *Solen*, &c., but are at a distance from each other when the branchiæ are remote: in this last case they are always connected by a transverse nerve, as in *Modiola*, *Avicula*, *Lithodomus*, *Arca*, &c.

M. Rang separates the group of *Mytili*, consisting of Lamarck's genus *Modiola*, into two subdivisions.

Shell sulcated lon[

Example, *Modiola sulcata*. Shell bluish white; epidermis yellowish; hinge-margin dentilated.

Locality.—Indian Seas. Lamarck.



Modiola sulcata.
a, Shell closed, with byssus; *b*, outside view of valve; *c*, inside view of valve.

**

Shell not sulcated longitudinally.

Example, *Modiola Silicula* (including, according to M. Deshayes, *Modiola cinnamomea*). Shell marone brown or whitish; epidermis deep marone brown.

Localities.—Lamarck gives the seas of the Isle of France as the habitat of *Modiola cinnamomea*, and the seas of New Holland as that of *Modiola Silicula*.



Modiola Silicula.

Lithodomus. (Cuv.)

Animal oblong, very much elongated, thick, having the mantle prolonged and fringed posteriorly; anal aperture mesial; mouth furnished with very small triangular appendages; foot linguiform, canaliculated, but little developed, and carrying a byssus at its base in the early stages of the animal's life.

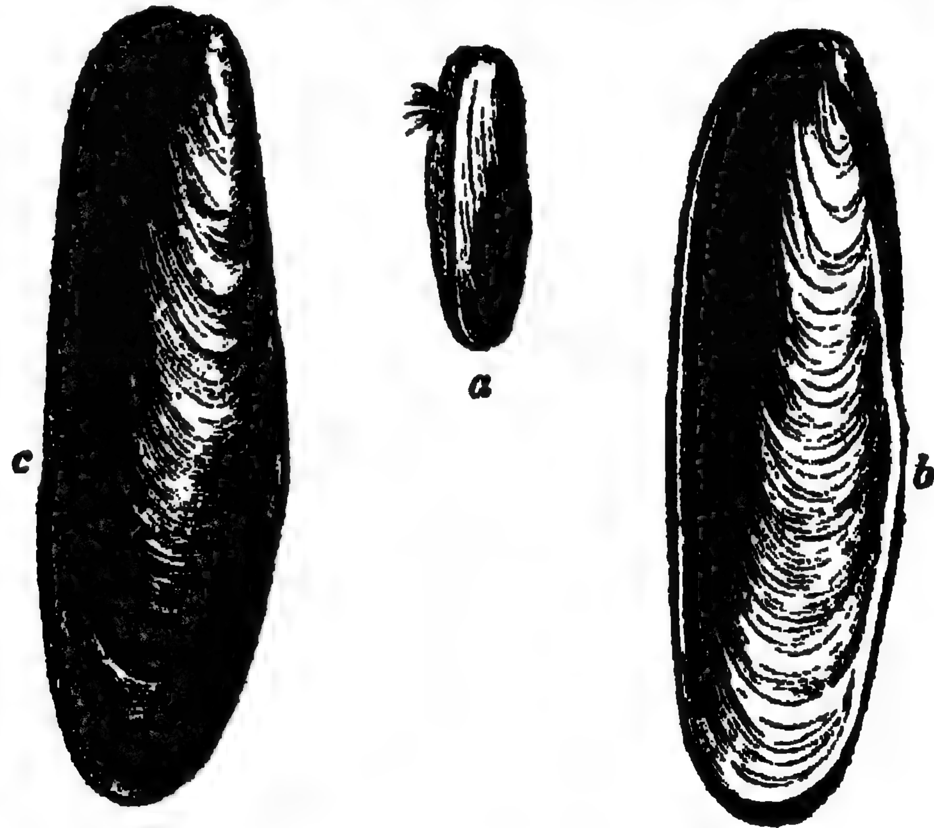
Shell delicate, covered with an epidermis, oblong, very much elongated, subcylindrical, rounded anteriorly, not gaping; umbo subanterior, very distinct; hinge toothless; ligament linear, for the most part internal, inserted in a narrow and elongated furrow; anterior muscular impression of considerable size.

Example, *Lithodomus Dactylus* (*Modiola lithophaga*, Lam.; *Mytilus lithophagus*, Linn.).

We have seen the opinion of M. Deshayes, as to the separation of this genus. M. Rang, on the other hand, thinks that this form has been separated from the *Mytili*, by M. Cuvier, with more reason than Lamarck had for the separation of the *Modiolæ* from that genus. The singular habits of the *Lithodomi* and the form of their shell justify perhaps, he thinks, this generic distinction, which moreover has generally been adopted since. In the early stages of life the *Lithodomi* suspend themselves to rocks and madrepores, by means of their byssus; but they soon pierce those bodies, in order to introduce themselves, and thus form cavities which they can never leave, in consequence of their increasing volume as they advance in age. The byssus then becomes useless, and is no longer manifested. These shells, says M. Rang, in continuation, are very common in the Mediterranean and at the Antilles, where they are found in stones and masses of madrepore, and sometimes, but much more rarely, in some thick shells.

This species is highly nutritious and well-flavoured. Imprisoned as the animal is in the stone or madrepore, frequently with a very small opening communicating with the sea, it must obtain a plentiful supply of food, probably by means of the currents produced by the animal; for the shells are always full and the animal plump. A stew of these *Lithodomi* is described by those who have partaken of it as excellent.

With regard to the power of piercing rocks, stones, wood, &c., possessed by Lamellibranchiate animals, Mr. Garner, in the paper above quoted, observes that such piercing cannot in every case take place by the mechanical action of the valves, and he instances those of *Lithodomus* as not at all adapted for such an action. He also denies the possibility of the perforation being caused by a solvent fluid secreted by the animal. 'The fact appears to be,' says Mr. Garner, 'that the phenomenon is caused by the vibratile action of the parts exciting constant currents of water against the substances, aided by its impetus when drawn in down the



Lithodomus Dactylus.
a, Young, with byssus; *b*, full grown, inside of valve; *c*, ditto, outside of valve; *d*, three specimens in a mass of madrepore.

elongated body of the animal, and in some cases perhaps by the rasping of the valves.'

Pinna. (Linnæus.)

Animal elongated, rather thick, subtriangular; lobes of the mantle united on the dorsal border, separated throughout the rest of their extent, ordinarily ciliated on the edges; foot slender, conic, vermiform, carrying at its base a silky byssus; mouth between two lips foliaceous within, very much elongated, and terminated by two pairs of short palps; the two palps of one side soldered nearly throughout their length; two adductor muscles; the anus terminating behind the posterior one. (Deshayes.)

Shell fibrous, horny, rather delicate, fragile, compressed, regular, equivalve, longitudinal, triangular, pointed anteriorly, rounded or truncated posteriorly; anterior umbo but little distinct; hinge linear, striate, toothless; ligament marginal, a great portion of it internal, very narrow and compact, occupying more than the anterior half of the dorsal border of the shell, in a narrow and elongated gutter; anterior muscular impression very small and entirely in the angle, posterior muscular impression very large. (Rang.)

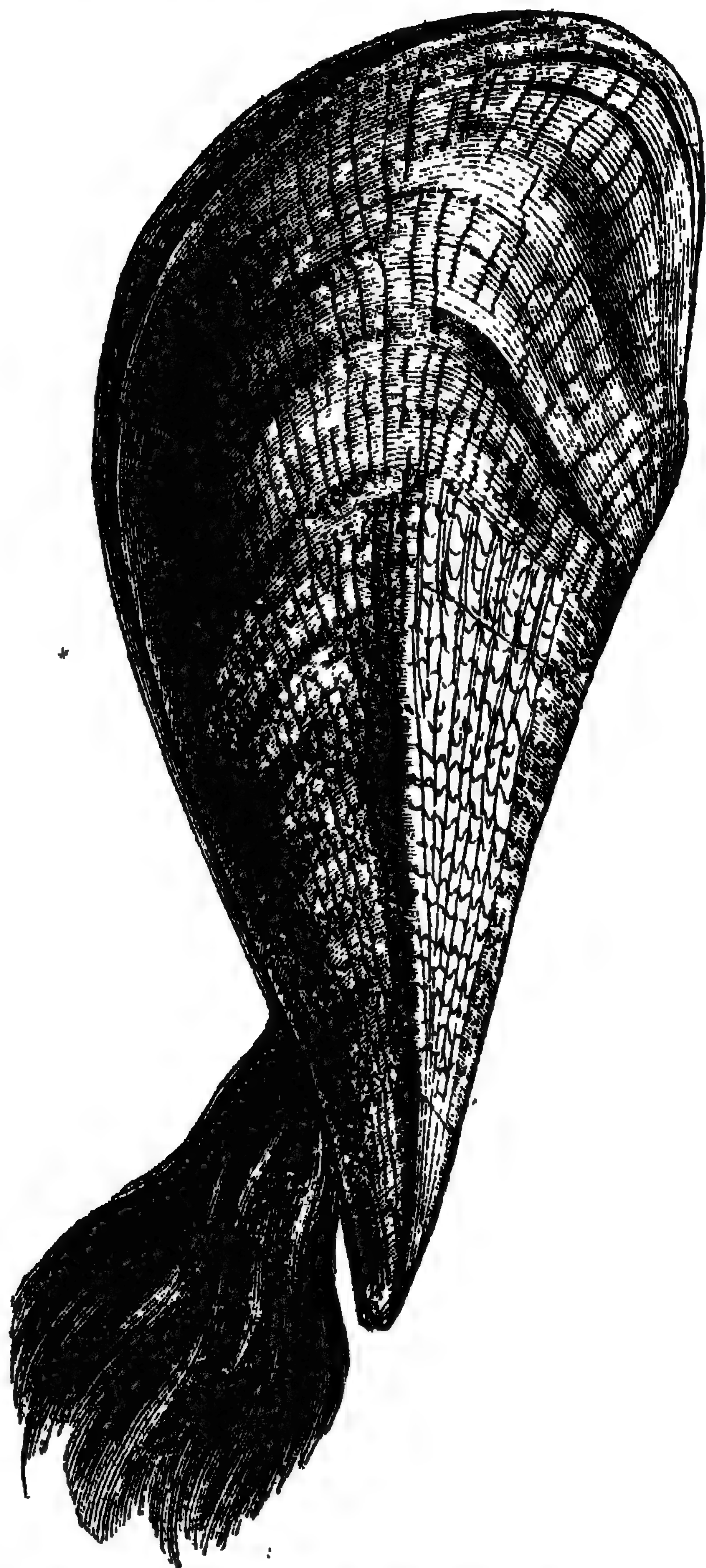
Poli has given beautiful figures of the animal, which he calls *Chimæra*, and most elaborate details of its anatomy; and to his great work we refer the reader. There are no projecting siphons, and the conic tongue-like foot is employed by the animal to fix itself by the byssus, which is not scanty and coarse, like that of the *Mytili*, but long, fine, lustrous, and abundant; so that, though it takes no dye, it is employed in manufacture in Italy. [BYSSUS; CONCHIFERA, vol. vii., p. 432.] The Pinnæ approximate more especially to the *Mytili*, but the shell of the former, with its straight umbones and its gaping opposite extremity, strongly distinguishes them. There is a tendency in their shell to divide itself into laminæ, and thus it approaches that of the *Malleacea*.

Example, *Pinna Flabellum.*



Pinna Flabellum.
a, Young, with spines, and the byssus, nat. size; *b*, full-grown, inside view of valve, one-fifth nat. size.

Habits, Geographical Distribution, &c.—The species are generally found in deep water, but they have been taken at depths ranging from the surface to 17 fathoms; most frequently on sandy bottoms, where they were moored by their byssus, and at no great distance from the shore. It is said that the animal sometimes fixes itself by the aid of its byssus, and sometimes removes itself by the aid of its foot. Small crustaceans, both brachyurous and macrurous, are sometimes found in their shells. Species occur nearly in all seas. Most of them are muricated when young with vaulted or subtubular spines; but as they increase in age, these are worn down, and at last almost entirely disappear. We have had individuals of the great Mediterranean *Pinna* before us, gradually increasing from a very small size to nearly two feet in length. When specimens taken at wide intervals were compared, the difference was so great that they might easily have passed as distinct species, as indeed they have been described by some authors. We have seen many pearls from this *Pinna* not ill formed and of an amber colour, but none of any considerable size.



Pinna Flabellum, full-grown, valves closed, outside view, with byssus, one-fifth nat. size.

FOSSIL MYTILIDÆ.

Mytilus.

Mr. G. B. Sowerby (*Genera*) states that the fossil species with which he is acquainted are not numerous; they occur however, he observes, in some of the beds below the chalk, as well as in most of those above it, but particularly in the crt

Deshayes, in his Tables (1833), makes the number of fossil species (tertiary) fifteen. *M. Chemnitzii* and *M. edulis* he states to be both living and fossil (tertiary). In the last edition of Lamarck (1836), he remarks that Brocchi mentions a fossil shell to which the latter gives the name of *Mytilus edulis;* but M. Deshayes does not believe that this fossil is the analogue of *Mytilus edulis*, Linn., but of an-

other edible species very common in the Mediterranean. Of fossil species he admits nine only in that work. Dr. Mantell notices a species in the cliff between Brighton and Rottingdean (diluvium); and another, *M. lanceolatus*, in the Shanklin sand. Professor Phillips notes a *Mytilus cuneatus* from the inferior oolite, in his list of organic remains of the Yorkshire coast. Dr. Fitton, in his 'Systematic and Stratigraphical List of Fossils' (*Strata* below the chalk), enumerates the following species: *M. edentulus, inæquivalvis, lanceolatus, Lyellii, prælongus, tridens*, and an undetermined species.

Dreissina.

Fossil in the modern calcaire of Aratapak and Transylvania, in Moravia, and the environs of Vienna. (Vanbeneden.)

Here we may perhaps place *Mytilus Brardi*. The septum comes very near to that of *Dreissina*.



Mytilus Brardi.

a, Hinge and septum enlarged; *b*, outside of valve; *c*, inside.

Modiola.

Mr. G. B. Sowerby states that the fossil species are not many. He observes that such as he knows seem to belong principally to some beds of the oolite series, and that there are others in the principal formations both above and below the chalk. M. Deshayes, in his Tables, makes the number of fossil species (tertiary) twenty-one; and *Mod. barbata discrepans* and *lithophaga* (Lithodomus), both living and fossil (tertiary). In the last edition of Lamarck the number given is twenty. The shell from Plaisance, considered by Lamarck to be a variety of *Modiola subcarinata*, is not, in the opinion of M. Deshayes, a variety of that species, but very probably the analogue of *Modiola barbata*; and he says that another (*Mod. lithophagites*) is not a *Modiola*, but a *Gervillia*. Dr. Mantell notes *Mod. elegans* in the arenaceous limestone or sandstone of Bognor, and *Modiolæ æqualis* and *bipartita* in the Shanklin sand. Professor Phillips enumerates the following species among the organic remains of the Yorkshire coast:—*Modiolæ, scalprum* (marlstone), *plicata* (inferior oolite), *bipartita* (calc. grit), *cuneata?* (Oxford clay, Kelloways rock and cornbrash), *imbricata* (Bath oolite), *Hillana* (lias), *ungulata* (coralline, Bath and inferior oolite), *pulchra* (Kelloways rock), *aspera?* (inferior oolite), *inclusa* (coralline oolite). Mr. Lonsdale (*Oolitic District of Bath*) records *Modiolæ Hillana* (lias), *gibbosa* (inferior oolite), *Hillana?* and *plicata* (fullers' earth), *imbricata* (cornbrash), *bipartita* (Kelloways rock). Dr. Fitton (*loc. cit.*) gives the following list: *Modiolæ æqualis, alæformis, aspera, bella, bipartita, depressa, imbricata, lineata, parallela, reversa*, two new unnamed species, one (casts), and a doubtful species. Those are principally from the lower green-sand. One (*bella*) occurs in the gault as well as in the green-sand, and *bipartita* also in the Oxford oolite. The new and doubtful species appear to have been found in the Purbeck and Portland stone, lower green-sand, and Oxford oolite. Mr. Murchison (*Silurian System*) notes *Mod. semisulcata* (lower Ludlow rock) and *M. antiqua* (Wenlock shale).

Lithodomus.

M. Deshayes (*Tables*) does not mention this genus in his Tables, and appears to place it under *Modiola*, a position which it occupies in Lamarck's work. M. Deshayes records *Modiola lithophaga* (var.)—*Lithodomus lithophagus*—as fossil at Paris. Mr. Lonsdale (*loc. cit.*) notices a *Lithodomus* in the inferior oolite, and another in the coral rag. Dr. Fitton (*loc. cit.*) records a new species and another species, both nameless, in the Portland stone.

Pinna.

Mr. G. B. Sowerby (*Genera*) states that he is acquainted with several fossil species, which occur in the secondary and tertiary beds of marine origin; one, in particular, he observes, is beautifully preserved in the indurated sandy bed of London clay at Bognor; and another, he adds, is not unfrequently met with in the calcaire grossier at Grignon. M. Deshayes gives the three as the number of fossil species (tertiary), and records *P. nobilis* as both living and fossil (tertiary). In the last edition of Lamarck, he notices the fibrous structure of the shell in this genus [SHELL], and says that in the tertiary beds the fibrous part decomposes into calcareous filaments, which detach themselves from the nacreous part, the preservation of which is more perfect. When this last part is a little gone (degradé), the point or junction of the two parts of which the valves are formed is perceptible; and it is, he adds, to a similar disposition observed in an individual of the *Pinna nobilis*, or *squamosa* of Italy, that the creation of Lamarck's species, *Pinna quadrivalvis*, is due. *Pinna margaritacea* (Paris, Grignon, &c.), *P. ampla* (oolite in England, France, and Germany), and *P. Saussurei* (coral rag of St. Mihiel, Mont Salève, Normandy), are the other fossil species enumerated. Dr. Mantell notices *Pinna affinis* from the arenaceous limestone or sandstone of Bognor, and another nameless species, for which he cites Martin (*Geol. Mem. West Suss.*), from the Shanklin sand. Professor Phillips (*loc. cit.*) gives us *P. gracilis* (Speeton clay), *P. mitis* (Oxford clay and Kelloways rock), *P. lanceolata* (coralline oolite and calc. grit.), *P. cuneata* (cornbrash and Bath oolite), and *P. Folium* (lias). Mr. Lonsdale (*loc. cit.*) gives a species, nameless, from the inferior oolite, and another nameless, with a note of interrogation, from the Kelloways rock. Dr. Fitton (*loc. cit.*) enumerates *Pinna? crassa*, n. s., from the lower green-sand; *P. tetragona*, from the lower green-sand, Kent, Sussex, and Isle of Wight, and at Blackdown; and a cast and a species, new? from the lower green-sand (Sussex and Isle of Wight).

MY'TILUS EDU'LIS, the edible muscle, a molluscous animal or shell-fish, common along the coast of Britain, is generally considered a safe and wholesome article of food, but it occasionally gives rise to troublesome and even fatal affections in those who partake of it. No anatomical investigation into the condition of such specimens as prove injurious, nor chemical analysis of their composition, has revealed the cause of the disorder; but as such casualties result mostly in summer, it is probable that some natural change is taking place in the animal, which renders it at that season unfit for food. It would therefore be prudent to use it only in the winter months. The idea that it is owing to the fish having absorbed copper is quite unfounded. The application of heat in cooking does not destroy the noxious property, as it does that of many vegetable poisons, for those which are dressed are as hurtful as those eaten raw. Neither does decay seem to be the source of the deleterious principle, since bad effects follow the use of those which are quite fresh; nor does decay decompose the poison, though most animal poisons are destroyed by putrefaction, for two fatal cases have ensued from the eating of decaying muscles. (See cases by Dr. Burrows, in *London Medical Repository*, iii., p. 445.) The consequences have been imputed to idiosyncrasy in those who eat the muscles; but this is obviously inadequate to explain the circumstances, since in most of the instances every person (amounting in one case to thirty individuals) who tasted them suffered; and even cats and dogs, as well as human beings, died from eating them. The morbid symptoms vary, and in some of the cases are connected with inflammation of the stomach and intestines, and require venesection for their relief; but more commonly 'the local effects have been trifling, and the prominent symptoms have been almost entirely indirect, and chiefly nervous. Two affections of this kind have been noticed: one is an eruptive disease, resembling nettle-rash, and accompanied with violent asthma; the other a comatose or paralytic disorder, of a very peculiar description. The symptoms have usually commenced between one and two hours after eating, and rapidly attained their greatest intensity. The first symptoms were like those of violent catarrh, swelling and itching of the eyelids, and generally nettle-rash followed; and the eruption afterwards gave place to symptoms of the most urgent asthma. The swelling is not always confined to the eyelids, but has usually extended over the whole face. In several cases the eruption was preceded by asthma, lividity of the face, insensibility, and convulsive movements of the extremities; in others, nausea and vomiting, followed by heat and constriction of the mouth and throat; difficulty of swallowing and speaking freely; numbness about the mouth, gradually extending to the arms, with great debility of the limbs.' The abdomen is often affected with pain, increased on pressure; the functions of the kidneys disturbed, but generally

increased; the bowels sometimes obstinately constipated. Epileptic symptoms, or delirium, convulsions, and coma have appeared in the greater number of fatal cases, rather than inflammatory action.

Emetics, such as sulphate of zinc, which acts quickly, have been of service; but æther seems the most effectual means of relieving the difficulty of breathing and the other nervous symptoms. Purgatives were found of no avail in some of the fatal cases accompanied by constipation; yet in general sulphate of magnesia (Epsom salts) in a large quantity of fluid, acidulated with dilute sulphuric acid, taken in small and frequent doses, is very efficacious in removing the eruption of nettle-rash. (Combe, in *Edin. Med. and Surg. Journal*, vol. xxix., and Christison *On Poisons*.) [MYTILIDÆ, p. 46.]

MYXI'NE, a remarkable fish belonging to the order *Cyclostomi*, family *Petromyzidæ*, and genus *Gastrobranchus* according to Bloch. It is the *Mixine glutinosa* of Linnæus, who, from its worm-like form, placed it in the class Vermes.

The Myxine is usually about a foot in length, of a slender and nearly cylindrical form, compressed towards the tail; the dorsal fin is very narrow and continued round the end of the tail to the vent; on the head is a single spiracle which communicates with the interior; the head is rounded and destitute of eyes; eight cirri, or feelers, have their origin on the lips; the mouth is large; on each side of the tongue there are two rows of strong pectinated teeth; the palate is furnished with a single hooked tooth: the branchial openings are two in number, and situated on the abdomen a little beyond one-fourth of the entire length.

This remarkable fish frequents the northern seas, and occurs also on our own coast. It is found in the bodies of other fishes, especially the cod and haddock, and sometimes five or six specimens are found in one fish. Pennant says 'it enters the mouths of other fish when on the hooks attached to the lines which remain a tide under water, and totally devours the whole except the skin and bones.' It is sometimes called the Hag, and also Borer, because it is said by some that the myxine pierces a small aperture in the skin, and thus makes its way into the body of the cod or other fishes which it attacks.

MYZOME'LA. [MELIPHAGIDÆ, vol. xv., p. 82.]

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*** In the Table of Public Buildings at Munich, page 485, the architects' names to the following ones should be corrected as here given:—
St. Bonifacius . . . Ziebland. Post Office . . . Klenze. Georgianum . . . Gartner.

N.

N is one of the liquid or trembling series of letters. It is formed with the tongue at the point where the teeth and palate meet, and the sound passes chiefly through the nasal passage. For the characters by which this letter is represented, see ALPHABET.

The letter *n* is subject to the following changes:—

1. It is interchangeable with *nd*. Thus the Latin roots *men*, *fini*, *gen* (genus), appear in Saxon English as *mind*, *bind* or *bound*, *kind* or *kin*. The converse change is common in the provincial dialect of Somersetshire, where the English words *wind*, *hind* (behind), *find*, *round*, *and*, are pronounced *wine*, *hine*, *vine*, *roon*, *an*; while on the contrary, *manner* is changed to *mander*. [D.]

2. Before *f*, *n* was silent in Latin. Hence the town *Confluentes*, at the junction of the Moselle and Rhine, is now called *Coblenz*. So the German *fünf* is in English *five*.

3. N final often becomes a more complete nasal, and is equivalent to *ng*. Thus the German infinitive in *en* appears to be the parent not only of the participle in *end*, but of the substantive in *ung*, with which are connected the English participle and substantive of the same form in *ing*. The Somersetshire dialect prefers the *n* without *g*, as *stanin*, *sparklin*, *starvin*, for *standing*, *sparkling*, *starving*. The Sanscrit alphabet has a particular character for this sound.

4. *Ni* or *ne* before a vowel often forms but one syllable with that vowel, the *i* or *e* being pronounced like the initial *y*. This sound is represented in Italian and French by *gn*, as *Signor*, *Seigneur*; in Spanish by *ñ*, as *Señor*; and in Portuguese by *nh*, as *Senhor* · all derived from the Latin *senior*, elder.

5. *N* is interchangeable with *l*. Hence the double form of *luncheon* and *nunchion*; but see L.

6. *N* with *m*, particularly at the end of words. [M.]

7. *On* and *o* are frequently interchanged. Hence the disappearance of the final *n* in the Latin nominatives *ratio*, *ordo*, *Laco*. The Portuguese also often discard an *n* so placed. On the other hand the Greek neuter nominative takes an *n* to which it is not entitled, as αγαθον. It is probably from a confusion between the two sounds that the question has arisen, whether the letter *ain* of the Hebrew alphabet is an *o* or an *n*.

8. *R* final with *rn*. Hence the double forms of the Latin verbs *cer* and *cern*, separate; *ster* and *stern*, strew; *sper* and *spern*, kick, despise. Again *star* (and the Latin must once have had *stera* in order to form from it the diminutive *stella*, as from *puera* comes *puella*) is in German *stern*. *Spur* in English is *sporn* in German, and of the same origin perhaps is the name of the *Spurn Head*, at the mouth of the Humber, as well as the Latin *spern-ere*. The Latin *bur* (seen in *com-bur-o*) is the same word as the English *burn*; and even the Latin *curr-ere*, to run, has in Gothic the form *urn-an*, just as the south-western dialect of England has *hirn*, and the ordinary English, by a slipping of the *r* [R], *run*. In the same south-western dialect *beforne*, *avaurn*, *orn*, *norn*, *ourn*, are the forms employed for *before*, *afore*, *or* or either (Germ. *oder*) *nor* or neither, *our*.

9. *N* with *s*. This change will not be readily admitted without consideration, as the sounds appear so different. The change however is very parallel to the admitted change of *l* and *d*; and indeed as the two latter letters are formed at the same part of the mouth, so are *n* and *s*. The close connection of the two letters will be most forcibly demonstrated by examples of suffixes in which the change occurs. Thus the English language has a double form of the plural suffix in *en* and *es*, as in *oxen* and *asses*. The Greek verb has the same variety; first, in τυπτομεν and τυπτομες; secondly, in τυπτετες, which must have been the older form of τυπτετε, and the so-called dual τυπτετον. The Latin again has the *s* suffix in *scribimus scribitis*, but the *n* in *scribunt*. Again the Latin comparative has for its oldest suffix *ios*, as in *melios*, whence both *melior* and *melius*; or a better example occurs in *pleios* and *pleos*, whence the latter forms *plous* and *plus*. On the other hand the Greek suffix is ιων, as πλειων and πλεον, from the same root as the Latin *plus*, and with the same meaning. The old genitive plural suffix in Latin appears to have been *sum*, as *servosum*, whence *servorum*. The suffix for a female in Greek is either *na* or *sa*, with perhaps an *i* prefixed, as βασιλιννα, μελαινα, λεαινα, or βασιλισσα, τυπτουσα and in English we have *ess*, while the Germans have *inn*. Lastly, such verbs as σβεν-νυμι have σβεν for the radical part, which often takes the form σβες, as α-σβεσ-τος; and the same change appears in σωφρον, Nom. σωφρων and σωφροσυνη. If the change be admitted, we see the cause of the anomaly in the Latin *pon-o*, *posu-i*, *pos-itum*.

10. *N* before *s* silent, but lengthening the preceding vowel. This fact is well exemplified throughout the grammar of the Greek language. The Latin had the same peculiarity. Hence *consul* was sometimes written *cosol*, and when abbreviated was always represented by the three first of the sounded letters, viz. *cos*. So *censor*, *infans*, *viciens*, *vicensumus*, are often found in the form *cesor*, *infas*, *vicies*, *vicesimus*. We see too why the Greeks wrote the Latin words κηνσωρ, Κωνσταντινος, with a long vowel in the first syllable. Lastly, while the Germans write *gans*, *wünschen*, the English have *goose*, *wish*.

11. *N* silent at times before *t* and *th*. The English word *mutton* is derived from the French *mouton* and the Italian *montone*; and our word *tooth* in the older Gothic dialects was *teenth*, thus corresponding as nearly as it ought to do with the Greek οδοντ, and Latin *dent*.

12. *N* before *v* silent. Thus the Latin *convention*, assembly became *covention* (as it occurs in one of the oldest inscriptions), before it was reduced to *contion*, the assembly of the people, a word which modern editors, in spite of all the best MSS. and of etymology, persist in writing with a *c* for the fourth letter. Similarly from *conventu* came the French *couvent*; and though the English generally say *convent*, yet the name *Covent Garden* is a proof that the *n* was not always pronounced even here.

An initial *n* is sometimes prefixed to, and sometimes taken from words by error. Thus *nadder*, a snake, has now lost its *n* through a confusion of the phrase *a nadder* with *an adder*. On the other hand, the phrase *for then once*, i.e. *for this once*, in which the article has its old accusative form *then*, is now written *for the nonce*. Is it in this way that we should account for the prefixed *n* in the diminutives *Ned*, *Nol*, *Nan*, *Nelly*, for *Edmund* or *Edward*, *Oliver*, *Anne*, *Ellen*, as if the original phrases *mine Ed*, *mine Anne*, had been confounded with *my Ned*, *my Nan*? At any rate, *mine*, *thine*, *an*, were severally the original forms of *my*, *thy*, *a*, and used even before consonants; nay, in Somersetshire they have changed *aunt* to *nânt*, *uncle* to *nuncle*, *awl* to *nawl*. Very similar is the prevailing error of calling the Greek negative particle *alpha privative* instead of *an privative*; the latter of which corresponds so accurately with the Latin *in* and the English *un*, to say nothing of the Greek ανευ, and the German *ohne*. In fact, *n* at the end of words is often pronounced very faintly.

The Somersetshire dialect has been referred to because its peculiarities have been recorded with great care in Mr. Jennings's 'Observations.'

NABATHÆI. [ARABIA, p. 215.]

NABIS, tyrant of Sparta, attained the supreme power after the death of the tyrant Machanidas, who was killed about 206 B.C. He proved a cruel despot, and put to death a number of citizens. He had an ingenious engine of torture, described by Polybius (xiii.), which was called Nabis's wife, and which he applied to those who would not deliver up their money to him. He allied himself with Philip II. of Macedon, and took possession of Argos and other parts of the Peloponnesus. After the defeat of Philip, and the peace which followed between him and Rome, the consul Flamininus marched against Nabis, defeated him, but afterwards granted him peace, taking his son as hostage to Rome. After the departure of the Romans, Nabis having begun to annoy his neighbours afresh, the Achæans sent against him their general Philopœmen, who defeated him and drove him back into Sparta, where Nabis was soon after treacherously killed by his own Ætolian auxiliaries, B.C. 192. (Livy, xxv. 35.) He appears to have been a very able commander in war.

NABLOUS. [SYRIA.]

NABOB, or NABAB, a corruption of the Hindustani Nuwwab, which was the title of the governor of a province under the Mogul empire, such as the Nuwwab of Arcot, of Oude, &c. (Gilchrist, *Vocabulary*.) Several of these became gradually independent during the decline of the empire, and are now either allies or dependents of the Anglo-Indian government. The word Nabob is sometimes used in Europe to mean a wealthy man who has made his fortune in India.

NABONASSAR, ÆRA OF. [PERIODS OF REVOLUTION.]

NABOPOLASSAR. [BABYLON.]

NACHITOCHES. [LOUISIANA.]

NACRE. [SHELL.]

NACRITE, a mineral usually occurring in mica slate, taking the place of the mica; so that the rock becomes a mixture of quartz and nacrite. It is also found crystallized in granite. It occurs in four-sided prisms. Hardness 2·75. Colour silvery, or light greenish white. Lustre pearly, silky, splendent. Translucent. Specific gravity from 2·788 to 2·793. It occurs in Wicklow, Ireland, and in North America.

A specimen from Brunswick, Maine, analyzed by Dr. Thomson, gave—

Silica	64·440
Alumina . . .	28·844
Protoxide of Iron .	4·428
Water	1·
	98·712

The crystals from Wicklow contained less oxide of iron, but a considerable portion of lime and of protoxide of manganese.

NADIR. [ZENITH.]

NÂDIR SHAH was born on the 11th of November, 1688, at the small village of Abuver, near Killaat, about 30 miles north-east of Mushed in the province of Khorassan. He was originally called *Nâdir Kouli*, that is, 'a slave of the Wonderful,' or 'of God.' When he entered the service of Tâmâsp, king of Persia, he assumed the name of *Tâmâsp Kouli Khân*, that is, 'Khan, slave of Tâmâsp;' but on his accession to the throne he resumed his original name of *Nâdir*.

The father of Nâdir belonged to the tribe of Afsshâr, which was one of the seven Turkish tribes which had attached themselves to the kings of Persia. He was a person of no note or rank, and earned his livelihood by means of making coats and caps of sheep-skins. Nâdir, after his elevation to the throne, used frequently to allude to his low birth. When the royal house of Delhi required that his son, who was about to marry a princess of that family, should give an account of his male ancestors for seven generations, Nâdir exclaimed, 'Tell them that he is the son of Nâdir Shah, the son of the sword, the grandson of the sword, and so on till they have a descent of seventy instead of seven generations.'

Nâdir was distinguished in early years by his boldness and intrepidity. At the age of seventeen he was taken prisoner by the Usbegs, who made annual incursions into Khorassan; but he effected his escape after a captivity of four years. On his return to Khorassan, he entered the service of a petty chief of his native country; but he became soon afterwards the leader of a formidable band of robbers. From this employment he rose, by a transition by no means uncommon in the East, to a high rank in the service of the governor of Khorassan; but having displeased his master, he was degraded and severely punished. After this he resumed his occupation as a robber; and in consequence of the unsettled state of the country, he acquired in a short time no small degree of power. In order to understand clearly the circumstances which facilitated the rise of Nâdir, it is necessary to make a few remarks on the internal state of Persia at that time.

In the early part of the eighteenth century, Persia was attacked and eventually conquered by the Affghans. In 1722 Shah Hussein, the Suffavean monarch of Persia, abdicated the crown to Mahmud, the Affghan conqueror. Mahmud was succeeded in 1725 by Ashrâff; who reigned at Ispahan and had the supreme power, though Tâmâsp, the son of Hussein, maintained a precarious independence in a distant part of the empire. Though the power of the Suffavean monarchs had been entirely overthrown by the Affghans, yet the latter had not been able to establish their own authority in the distant provinces of the kingdom; and the consequence was, that Khorassan and other remote provinces were left without any regular government. Nâdir was thus enabled to prosecute his schemes without interruption; and having at length raised a body of 5000 men, he joined Tâmâsp in 1727, and declared his intention of expelling the Affghans from his native country. The oppressive rule of the Affghans and the renown of Nâdir quickly brought great numbers to his standard; and having been invested with the supreme command by Tâmâsp, which he acquired by putting to death Futteh Ali, who had previously commanded the forces of the king, he marched against the Affghans and took Mushed in the same year. He followed up his first success with several brilliant victories; Ispahan fell into his power; Ashrâff was taken and put to death; and by the close of the year 1729 few if any Affghans were left in Persia.

Such sudden and unexpected success rendered Nâdir exceedingly popular; and he appears from this time to have resolved upon seizing the royal power as soon as circumstances would allow him to do so. In 1730 he received from Tâmâsp a grant of the four finest provinces of the kingdom, Khorassan, Mazanderan, Seistan, and Kerman; and was requested at the same time to assume the title of sultan. This honour however he declined; but at the same time he ordered money to be struck in his own name, which in the East is regarded as a virtual assumption of the sovereignty of the country.

In 1731 Nâdir was engaged in a war with the Turks, whom he defeated on the plains of Hamadan; but having been obliged to march to Khorassan to quell a rebellion, Tâmâsp seized the opportunity of assuming the command of the army, and marched himself against the Turks. Being defeated in battle, he concluded a treaty with the Turks, by which he ceded to them several provinces of the Persian empire. As soon as Nâdir heard of this treaty, he took advantage of the discontents which it excited, to carry into execution the plans he had long meditated for seizing the royal power. He published a proclamation, in which he bitterly inveighed against the peace, and announced his intention of prosecuting the war. Having thus secured the good will of the people, he invited Tâmâsp to his camp; and on his arrival, he caused him to be seized and carried away to Khorassan. Instead however of proclaiming himself king, he considered it more prudent for the present to place on the throne the son of Tâmâsp, who was an infant eight months old.

Having completed these arrangements, Nâdir continued the war against the Turks, and after experiencing some reverses, he obliged them to sue for peace, which was granted in 1735. The infant sovereign of Persia having died about the same time, Nâdir summoned a grand council, consisting of almost every person of rank and consideration in the kingdom, to meet in the plains of Chowal Mogâm, which extend from the neighbourhood of Ardebil to the mouth of the Cyrus, in order to take into consideration the state of the kingdom. Upwards of 100,000 persons are said to have attended this assembly, in which the sovereignty was offered to Nâdir, who accepted it with apparent reluctance, on the 26th of February, 1736, on condition that the Sheah sect, which had hitherto been supported by the great majority of the Persians, should be entirely abolished, and the sect of the Sunees established in its place. He also stipulated that the Imaum Jaaffer should be placed at the head of the national religion; and that as there were four orthodox sects among the Sunees, the Persians should be considered as a fifth, under the name of the sect of Jaaffer. It is difficult to determine the reasons which induced Nâdir to make this violent change in the religion of the country; but it appears most probable that he wished to destroy the Sheah sect, since it had always warmly supported the dynasty of the Suffavean princes. All the religious property of this sect, which was very considerable, was confiscated by Nâdir, and this impolitic attack upon the established religion tended to produce discontents at the very commencement of his reign. Nâdir himself appears to have possessed little or no religion; and the Koran as well as the Gospels, which were translated into Persian by his order, were frequently the subjects of his merriment and sarcasm.

Soon after his accession to the throne, Nâdir made vigorous preparations for the extinction of the Affghans as a separate power; and as this object could not be accom-

plished without the reduction of the city and province of Candahar, which were then in the possession of the brothers of Mohammed, the late Affghan monarch of Persia, he commenced the war by an invasion of this province. The city of Candahar fell into his power in 1738, and many of the Affghans fled into the northern provinces of Hindustan, where they were hospitably received. Nâdir required of the emperor of Delhi that none of the Affghan fugitives should find shelter in his dominions, but as no attention was paid to his demands, he marched into Hindustan in the following year, and after defeating the Mogul troops, entered Delhi on the 8th of March, where he seized the immense treasures which had been amassed in the course of nearly two centuries by the Mogul monarchs. Soon after his arrival, a report having been spread through the city that Nâdir was dead, the inhabitants made a general attack upon his soldiers. Nâdir in vain endeavoured to undeceive the populace; his moderation only inflamed the fury of those whom, according to Hindu historians, it was his desire to save; and at length, unable to restrain the people, he gave orders for a general massacre. These commands were too well obeyed; and from sunrise till noon the inhabitants were butchered by his soldiery without any distinction of sex and age. At the intercession of Mohammed, the emperor of Delhi, Nâdir at length commanded the massacre to be stopped; and it is recorded as a proof of the high state of discipline of his troops, that his commands were immediately obeyed. The number of those who perished in this massacre is variously stated by different writers. Fraser says that 120,000 persons were killed; but a Hindu historian reduces the number to only 8000. (Scott's *Translation of the History of the Dekkan*, vol. ii., p. 207.)

Nâdir did not attempt to make any permanent conquests in Hindustan. He returned to Persia in the following year, and directed his attention towards the reduction of the nations on the north of Persia. He crossed the Oxus in order to punish the sovereign of Bokharah, who had, during his absence in Hindustan, made inroads into Khorassan. This monarch having submitted to his power, Nâdir next marched against the king of Khaurizm, whose dominions extended westward of Bokharah along both banks of the Oxus as far as the Caspian. The king of Khaurizm, refusing to submit to Nâdir, was defeated in battle, taken prisoner, and put to death, 1740.

By these conquests Nâdir had completely secured the peace of Persia. He had delivered his native country from the tyranny of the Affghans, and had extended its dominions to the Indus on the east, the Oxus on the north, and almost to the plains of Bagdad on the west. The Turks, who frequently endeavoured during his reign to extend their dominions, were always repulsed with loss; and the Russians were glad to enter into alliance with this all-powerful conqueror. Hitherto Nâdir had ruled with moderation and justice; but the latter part of his reign was disgraced by acts of the foulest tyranny and oppression. His conduct during this period has been described, even by a partial historian (Mirza Mahadi), as exceeding in cruelty and barbarity all that has been recorded in history of the most bloody tyrants. In 1743 his eldest son, Reza Kouli, who had distinguished himself by his bravery in many actions, was deprived of sight by order of his father. The possession of absolute power appears to have called forth in the mind of Nâdir, as it has often done in the minds of other absolute monarchs, some of the worst passions of human nature—avarice, jealousy, and cruelty. During the early part of his reign Nâdir was distinguished by the greatest liberality; and after he had obtained the immense wealth of the imperial house of Delhi, he at first remitted three years' taxes. But the possession of such enormous wealth appears to have excited in him the desire of accumulating more; and the taxes were increased to meet the insatiable demands of the royal treasury. It has been already stated that the proscription of the Sheah sect had tended to render him unpopular. Nâdir, aware of this, ceased to trust any of the native Persians, who belonged almost entirely to the Sheah sect, and placed his chief dependence on the Turks and Affghans in his army, who were Sunees. So great was his suspicion of his own subjects, that he is said to have formed the design of putting to death every Persian in the army. Some of the principal officers of his court, having learnt that their names were included in the proposed massacre, resolved to save themselves by the assassination of the tyrant, and, having entered his tent during the night, put him to death, on the 19th or 20th of June, 1747. Nâdir was succeeded by his nephew Ali.

'The character of Nâdir,' observes Sir John Malcolm, 'is perhaps exhibited in its truest colours in those impressions which the memory of his actions has left upon the minds of his countrymen. They speak of him as a deliverer and a destroyer; but while they expatiate with pride upon his deeds of glory, they dwell with more pity than horror upon the cruel enormities which disgraced the latter years of his reign; and neither his crimes nor the attempt he made to abolish their religion have subdued their gratitude and veneration for the hero, who revived in the breasts of his degraded countrymen a sense of their former fame, and restored Persia to her independence as a nation.' (*History of Persia*, vol. ii., p. 103.)

The life of Nâdir Shah was written in Persian by his secretary, Mirza Mohammed Mahadi Khan, who attended him in all his expeditions, and has been translated into French by Sir W. Jones. Fraser also published from Persian MSS., which he obtained in India, 'The History of Nâdir Shah, formerly called Thamas Kuli Khan, the present Emperor of Persia,' Lond., 1742. Many interesting particulars relating to Nâdir are given by Hanway, in his 'Historical Account of the British Trade over the Caspian Sea,' Lond., 1753-4, which have considerable value, since Hanway had personal knowledge of many of the facts which he has recorded. A detailed life of Nâdir is also given by Malcolm in his second volume of the 'History of Persia.'

NÆSA. [ISOPODA, vol. xiii., p. 53.]

NÆVIUS CNEIUS, a native of Campania, and one of the earliest Roman poets, was older than Ennius, and the contemporary of Livius Andronicus. He served in the first Punic war, and afterwards wrote an epic poem on the same, 'De Bello Punico,' and another called 'Ilias Cypria.' He also wrote several dramas in imitation of the Greek, and other comedies on national or Roman subjects, such as 'Macchus exul,' 'Vindemiatores,' &c. Of all these, the titles and a few scattered lines are all that have come down to us. ('Fragmenta Poetarum Latinorum, quorum Opera non extant,' by Stephanus, 1564, and also Maittaire, 'Corpus Poetarum.')

Cicero, 'De Oratore,' ii. 69, 70, and iii. 12, praises him for his unaffected simplicity and native humour. It appears that he had a genius for the satirical, which proved unlucky to him; for, having exposed in his plays some of the leading men at Rome, among others some of the Metelli family, he was imprisoned and banished as an alien. He is said to have retired to Utica in Africa, where he died about B.C. 204, according to the chronicle of Eusebius. Aulus Gellius (iii. 3) says, that being imprisoned at Rome, he composed two comedies in his prison, through which he was restored to liberty.

NÆVUS (*Nævus maternus*, *Mother Spot* or *Mole*) is a congenital mark or morbid growth on a part of the skin. Nævi are of various kinds; some are merely yellowish or brown discolorations of the skin without any evident alteration in its structure; but the greater number are composed of an excessively vascular tissue, or a dense network of arteries and veins forming a reddish or livid substance, more or less elevated above the surface of the surrounding skin. A third kind are like extensive warty excrescences, and many of them are covered with thick-set coarse hair.

The nævi of the first kind rarely require treatment. Those of the second are more important from their tendency to increase, or to ulcerate and slough, or to produce severe hæmorrhage by the rupture of some of their vessels. Many plans have been suggested for their removal. If they be not seated on an exposed part, or if they do not show a tendency to increase, they had better be left without treatment. In other cases, the simplest and sometimes a sufficient means is the continued application of cold with moderately firm pressure; but a more certain method is to produce such an inflammation in them as may obliterate their vessels and reduce them to the common substance of scars. In small superficial nævi this may be effected by vaccinating them so as to produce a number of pustules on their surface; and in larger ones, by cauterising a part of their surface with fused potash, or nitric acid, or nitrate of silver, or by injecting some stimulant (as dilute nitric acid) into their tissue, or by making small incisions into them, or by passing hare-lip pins and

sutures [HARE-LIP] through parts of their substance, or by placing setons in them. The circumstances of each case must decide the choice between these several means, and the mode in which that which is selected may be best applied. Should complete removal be deemed necessary, nævi may be either cut out, or made to slough by tying them round the base. For the third kind of warty nævi, excision is at once the simplest and the most secure means.

It is a popular belief that nævi and some other malformations in infants are consequent on an impression made on the mind of the mother during pregnancy, and that the mark always bears some resemblance to the object by which the impression was excited. It cannot be denied, that among the many cases of nævi, some singular coincidences of the kind have occurred, and that in some of these the malformation might be deemed to have some connection with the object of the mother's fear or anxiety; but till it be determined that the number of these coincidences is greater than would occur according to the common laws of chances (which is as yet far from being proved), the hypothesis of a connection between the state of the mother's mind and the local conformation of the child, which is totally opposed to all physiological probability, cannot be admitted.

NAGASAKI. [JAPAN.]

NAGORE. [MARWAR.]

NAGPORE. [BERAR.]

NAGPORE, a large town in the dominions of the Rajah of Berar, or Nagpore, situated in 21° 9′ N. lat. and 79° 10′ E. long. It stands on a plain 1100 feet above the level of the sea. The town, which is of very irregular form, is about 7 miles in circumference, the buildings being placed in a very straggling manner, as is often seen in India. The greater part of the dwellings are small thatched cottages. Some of the richer inhabitants have large brick-built houses with flat roofs, but the number of these is small, and is continually decreasing through the declining condition of the town. According to an enumeration made in 1825, Nagpore contained at that time,

Houses built of brick . . .	1,301
Tiled houses	11,120
Thatched cottages or huts . . .	14,680
Matted huts of the lowest description .	48
Total	27,149

The population at the same time amounted to 115,228.

The palace of the rajah is a large, heavy, and very plain building of brick, and is surrounded by the lowest kind of houses or hovels: it has never been completely finished.

The trade of Nagpore, which was at no time very considerable, has declined since the fall of Appah Sahib, and the removal of the seat of government.

At the enumeration in 1825, it appeared that there were about 3500 domestic slaves, chiefly females, who had been purchased when children from their parents. The condition of slavery in this region does not bear much analogy to the state of degradation which is elsewhere implied in the name, since the severest punishment that can be inflicted for any crime committed by a slave is expulsion from the family of the master, and consequent manumission. On the other hand it would appear that the condition of free labourers is one of great hardship, so that life has little value in their eyes. Suicide is of very common occurrence, being resorted to upon the slightest occasions of domestic quarrel, or of real or supposed injury: the more usual modes employed for self-destruction are poison, drowning in wells, and hanging.

Nagpore is distant 733 miles from Calcutta, 577 miles from Bombay, 673 from Madras, 486 from Poonah, and 631 from Delhi, travelling distances. (*Report of Committee of House of Commons* in 1832; Rennell's *Memoir of a Map of Hindustan.*)

NAHUM (נַחוּם, Ναούμ), one of the twelve minor Hebrew prophets, was called the Elkoshite (הָאֶלְקֹשִׁי, *Nahum*, i. 1), probably from the place of his birth, Elkosh, a village in Galilee (Hieronymus, *Procem. in Nahum;* Eusebius, *Onomasticon*, art. 'Ελκεση'). He prophesied in the kingdom of Judah, whither we may suppose he had gone after the overthrow of Israel. His age can only be conjectured from certain indications contained in his prophecy, from which it appears that both the kingdoms of Israel and Judah had been subject to severe attacks from the Assyrians (chap. i.), and that the captivity of Israel had already taken place (chap. ii. 2). He is thought to allude to the destruction of Sennacherib's army (i. 11-14), as having occurred recently (ii. 1). He also prophesies the speedy restoration of Judah to prosperity (i. 15; ii. 7), which happened in the reign of Josiah. These circumstances would place his prophecy towards the close of Hezekiah's reign, about 705 B.C.

Some suppose that the destruction of Thebes and the captivity of the Egyptians and Ethiopians, spoken of in Nahum (ii. 8-10), are the same events to which Isaiah refers (chap. xx.); but this is uncertain.

His prophecy is a complete poem, the subject of which is 'the burden of Nineveh' (i. 1), that is, the destruction of Nineveh and the Assyrian empire, as the punishment of its wickedness and oppression. The prophecy commences with a sublime description of the power of Jehovah in punishing his enemies and protecting his people, and proceeds to foretell the impending destruction of Nineveh (chaps. i. ii.), which is described in the most vivid poetry in chap. iii. The event which he prophesies took place in the year 625 B.C., in the reign of Chyniladanus, king of Assyria, when Nineveh was destroyed and the Assyrian empire overthrown by Cyaxares I. and Nabopolassar.

'None of the minor prophets seem to equal Nahum in boldness, ardour, and sublimity. His prophecy too forms a regular and perfect poem; the exordium is not merely magnificent, it is truly majestic; the preparation for the destruction of Nineveh, and the description of its downfall and desolation, are expressed in the most vivid colours, and are bold and luminous in the highest degree.' (Bp. Lowth, *Prælect.*, xxi.) Some expressions and images, which are peculiar to him, occur in i. 10; ii. 4-9; iii. 17.

The canonical authority of Nahum's prophecy is undisputed.

(Rosenmüller, *Scholia in Vet. Test.*; Winer's *Biblisches Realwörterbuch*; the *Introductions* of Eichhorn, Bertholdt, Jahn, De Wette, and Horne.)

NAIA, Laurenti's name for a genus of highly venomous serpents, *Uræus* and *Aspis* of Wagler.

Cuvier places the form next to the Vipers (*Vipera* of Daudin), and immediately preceding *Elaps* (Schn., part). Mr. Gray makes *Naiina* the second subfamily of his *Viperidæ*, *Viperina* being the first. *Naiina*, which is characterised by Mr. Gray as having the 'head broad behind, with plates,' is immediately succeeded by *Elaphina*, and thus the genus *Naia*, in his arrangement, stands between *Pelius* (Merrem) and *Sepidon* of the same author. (*On the Genera of Reptiles*, in *Annals of Phil.*, 1825.)

Mr. Swainson, in his 'Classification of Reptiles' (*Natural History of Fishes, Amphibians, and Reptiles*, vol. ii.), places the genus *Naia* among the *Crotalidæ*, his second family of *Ophides*, or serpents, and arranges it between *Cerastes* and *Platurus*. He gives the following as the subgenera:—*Naia*, *Sepidon*, and *Elaps*, and thus characterises the subgenus *Naia*:—Neck capable of being dilated; head narrow; dorsal scales linear; tail conical; subcaudal plates arranged in two rows.

Geographical Distribution.—This form appears to be confined to the Old World.

The Asiatic species, *Coluber Naja* of Linnæus, *Coluber cæcus* of Gmelin? *Vipera Naja* of Daudin, *Naja tripudians* of Merrem, *Naja lutescens* of Laurenti, *Cobra de Capello* (adder with a hood) of the Asiatic Portuguese, *Serpent à lunettes* of the French, *Spectacle-snake* of the English, *Nag* and *Chinta nagoo* of the natives, may be considered as the type of the genus.

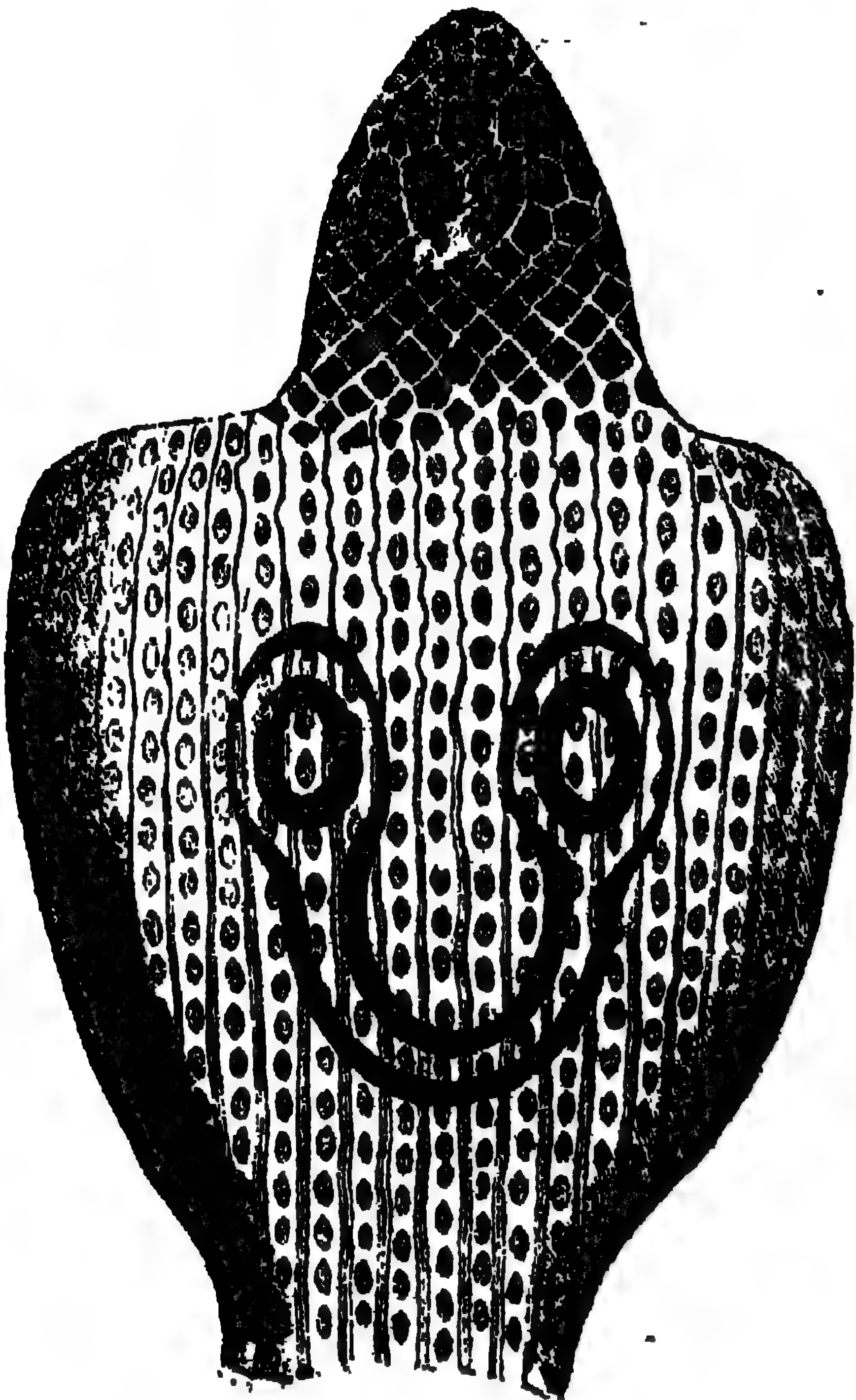
Generic Character.—Head, with nine plates behind, broad; neck very expansile, covering the head like a hood; tail round. (Gray.)

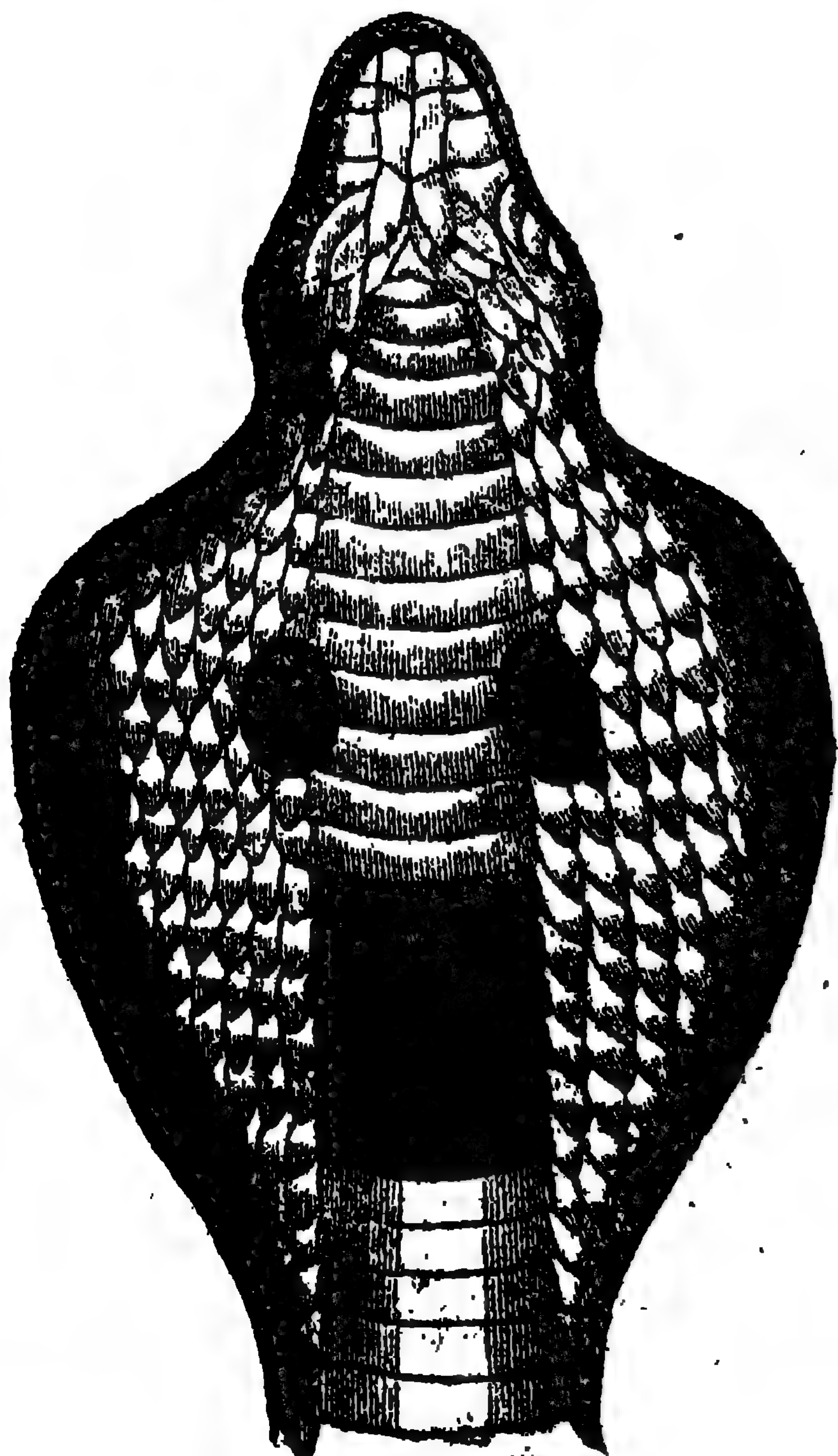
The expansion of the neck and upper part of the body is effected by the anterior ribs, which the animal has the power of raising and bringing forward so as to dilate that portion into a disk more or less large. When this disk is thus dilated in the *Naia tripudians*, it presents on the back part of it no bad representation of a pair of spectacles, or rather barnacles, reversed, for there is no trace of the lateral pieces by which spectacles are attached to the head of the wearer. The animal is brown above, and bluish-white beneath. The following cuts will convey some idea of the form of this snake, with the hood or disk expanded.



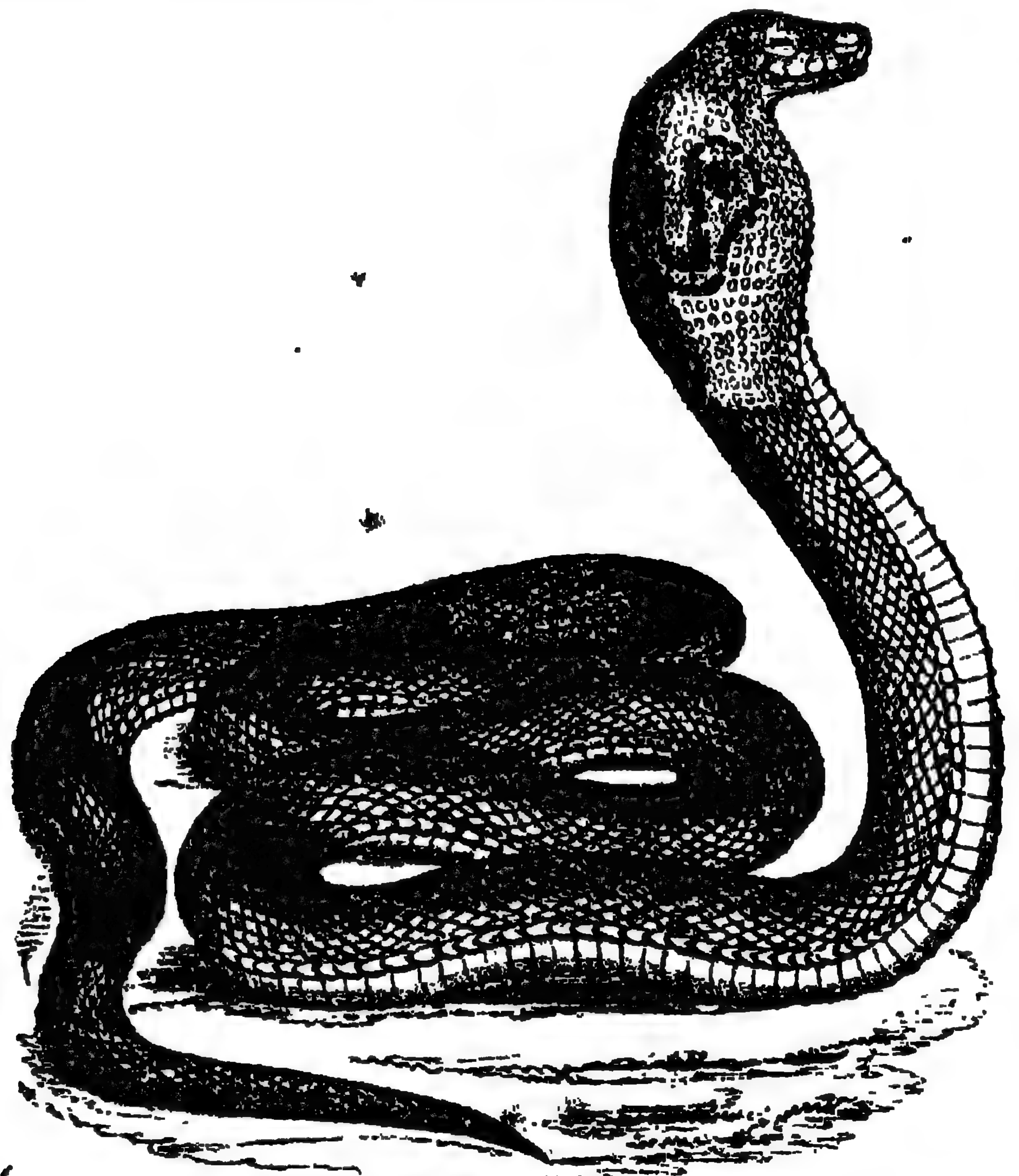
Head of Naia.
a, side view; b, seen from above.







a, view of the upper side of the disk or hood expanded, with the head on the same line with the body; b, view of the under side of the same; c, the disk or hood seen from behind, when the anterior portion of the excited serpent is in an erect posture.



Naia tripudians (reduced) in an erect and excited state.

Colonel Briggs informs us that this active and deadly serpent is sometimes worshiped in temples in India, where it is pampered with milk and sugar by the priests, and he notices it as a surprising instance of the effect of kind treatment in subduing the most irritable spirits. 'The Hindus,' says the Colonel, in continuation, 'have a notion that the sagacity and the long-cherished malice of this worm are equal to that of man. I have seen them come out from their holes in the temples, when a pipe has been played to them, and feed out of the hand as tamely as any domestic animal; and it is when in this state of docility, so opposite to their shy but impetuous nature, the common people believe that the Deity has condescended to adopt that form. It seems probable that this hooded snake was the dragon of the heathen worship; and the shape of its head and its activity when in a state of excitement probably gave rise to the fable of its being winged.'

It is pretended that the root of the *Ophiorrhiza mungos* is a specific against the bite of this serpent. The priests and jugglers however, who make them dance to astonish or amuse the people, make all sure, there is little doubt, by extracting the poison-fangs.

This formidable species, or at least some species of hooded snake, according to the records of travellers, grows to a considerable length. Captain Percival gives the following account of its size and habits, in his 'Account of the Island of Ceylon,' 4to., 1805:—

'The Cobra Capello, or hooded snake, is found here from six to fifteen feet long. Its bite is mortal. The natives find the herb pointed out by the ichneumon a remedy, if timely applied. When enraged and preparing to attack, it raises its head and body to the height of three or four feet in a spiral manner, while at the same time the remaining part of the body is coiled up to accelerate and give force to the spring. At this instant it distends from its head a membrane in the form of a hood, from which it receives its name. This membrane lies along the forehead and the sides of the neck, and is almost imperceptible till the animal gets into a state of irritation and is about to attack his foe. When the hood is erected it completely alters the appearance of the head, and discloses a curious streak in the shape of a pair of spectacles, and sometimes of a horse-shoe. The extension of this membrane seems intended by Providence to give warning to all those within this animal's reach that he is preparing to attack them. Without this signal he would be very dangerous indeed, as his motions afterwards are too rapid to be avoided. I have more than once been an eye-witness to instances where the fatal bite of this snake was escaped from merely by the object of his vengeance timely observing his preparations. One remarkable characteristic of those dangerous serpents is their fondness for music. Even when newly caught they seem to listen with pleasure to the notes, and even to writhe themselves into attitudes. The Indian jugglers improve greatly on this instinct, and, after taming them by degrees, instruct them even to keep time to their flageolet.'

The largest *Cobra de Capello* seen by Dr. Davy in Ceylon was nearly six feet long; and he adds that the general length is between two and four feet. The colour varied: those of a light colour were called high-caste snakes by the natives, and those of a dark colour low-caste. 'The natives,' says Dr. Davy, 'in general rather venerate this snake than dread it. They conceive that it belongs to another world,* and that when it appears in this it is merely as a visitor; they imagine that it possesses great power, that it is somewhat akin to the gods, and greatly superior to man. In consequence they superstitiously refrain from killing it, and always avoid it, if possible. Even when they find one in their house, they will not kill it, but, putting it into a bag, throw it into water. They believe that this snake has a good and generous disposition, and that it will do no harm to man, unless provoked.' Dr. Davy gives a pleasing picture of the irritations and soothings with which the snake-charmers excite and allay the temper of this serpent. He records several instances of the operation of the poison, the first arising from a serpent found in a bag floating down the Kalang-ganga. It was about five feet long, and about six inches in circumference in the broadest part. This snake bit a hen, fixing its fangs in the skin covering the lower part of the left pectoral muscle, and keeping its hold about two or three seconds, when Dr. Davy succeeded in shaking it off. The hen, which at first seemed to be little affected, died eight hours after she was bitten.

The reader will find other experiments recorded by the author; but the bite which was followed by the most speedy death was inflicted by another Cobra de Capello upon a young cock. 'The snake fastened on the thigh, and inflicted rather a severe wound, from which some blood flowed. The cock became instantly lame, and in less than a minute was unable to stand. In about five minutes his respiration became hurried and rather laborious; some alvine dejections took place. In about ten minutes he appeared to be in a comatose state, and for about five minutes he continued in this state, his respiration gradually becoming more feeble and laboured. In seventeen minutes, when his breathing was hardly perceptible, he was seized with a convulsive fit, which in the course of the next minute returned four or five times, each less violent than the former, and the last proved fatal.' (*An Account of the Interior of Ceylon, &c.*, by John Davy, M.D., F.R.S., 4to., London, 1821.)

We owe to Dr. Cantor, who has added so much to our knowledge of the natural history of Asiatic serpents, the introduction of a new genus of hooded snakes, *Hamadryas*, which will probably find its proper place in the series as a subgenus of *Naia*. The doctor himself gives it a position between that genus and *Bungarus* (Daudin), which two forms, in his opinion, it will be found to connect together

Hamadryas. (Cantor.)

Generic Character.—Head broad, subovate, deplanate, with a short obtuse rostrum, covered above with fifteen *scuta*. *Cheeks* tumid. *Eyes* large, prominent, pupil round. *Nostrils* widely opened within the confine of two *scuta*. *Gape* very ample, subundulated. *Poison-fangs* anterior, behind which are the maxillary teeth. *Neck* dilatable. *Body* thick, smooth, imbricated with smooth scales disposed in oblique rows. *Tail* short, covered with *scuta* and *scutella*, its apex acute. (Cantor.)

Example, *Hamadryas ophiophagus*. (Cantor.)

Description.—Above olive-green, girt with black sagittal striæ, abdomen glaucous, marbled with black. The Hindustanee name is *Sunkr-Choar*.

Locality.—Bengal.

Habits, &c.—Dr. Cantor thus describes the habits, the effect of the poison, and the history of this serpent.

'The *Hamadryas*, like the *Bungarus*, *Hydrus*, and *Hydrophis*, has a few maxillary teeth behind the poison-fangs, and thus, like the latter, connects the venomous serpents with isolated poison-fangs to the harmless, which possess a complete row of maxillary teeth.

'Of the terrestrial venomous serpents, the *Bungarus* is chiefly characterised by a distribution of the teeth similar to that of the *Hamadryas*, which, also partaking of the chief characteristic of the genus *Naja*, viz. that of forming a hood or disc, constitutes an immediate link between the genera *Bungarus* and *Naja*.

'In consequence of the strong resemblance in the general appearance between the *Naja* and the *Hamadryas*, when first my attention became attracted to the latter, I thought I could refer this serpent to that genus; and it was not until I was able to examine a specimen whose poison-fangs were untouched (those of the first specimens I saw having been drawn by the natives, who are greatly afraid of this serpent), that I discovered the maxillary teeth behind the poison-fangs.

'*Hamadryas ophiophagus* differs from the *Naja tripudians*:

'1. By its maxillary teeth.

'2. By the strongly developed spines on the *os occipitale inferius*.

'3. By the integuments covering the head.

'4. By the integuments covering the abdominal surface of the tail.

'5. By its colour.

'6. By its size.

'According to the natives, the *Hamadryas* feeds chiefly upon other serpents: in one I dissected I found remains of a good-sized *Monitor*, which fact may account for its arboreal habits, as I have in Bengal, along the banks of the rivers, observed numbers of those large lizards among the branches of trees watching for birds.

'The power of abstaining from food, generally speaking,

* Dr. Davy, in his chapter on the Singalese System of the Universe, has the following passage:—'The Naga-bhawené, that lies under Asoora-bhawené, is also 10,000 leagues in circumference. It is a hollow sphere, without mountains or hills, lakes or rivers, and entirely destitute of vegetation, with the exception of a single tree, called Parasattoo, that answers for all others, bearing not only an immense variety of flowers and fruits, but everything else that is desirable. The Naga-bhawené is the abode of a numerous race of snakes, similar in kind to the hooded snake, and of great size, beauty, and power, capable of passing from one part of the world to another, and shining like gods; so that, though they have no light but that which emanates from their own bodies, they enjoy perpetual day infinitely brighter than ours. In their former lives on earth they were persons of remarkable purity and goodness, almost deserving of becoming gods; but their high virtues were sullied by some vice, particularly that of malice, to which they owe their present forms. Though snakes, they are Bhoodists, and are in possession of a relic and worship in temples. They reside in well-furnished houses, and eat and drink, and enjoy society. By merely wishing, they immediately have any article of food they want; and whatever it may be, it always appears in the form of a frog. They are under a regal government, and are distributed into castes, like the Singalese. Their king, Mahakilla-naga-rajaya, is in every respect superior to the rest; it was with his assistance that the gods and Asooras churned the milky sea; he wound himself round a rock, and they, pulling at his two extremities, set the mass in motion and accomplished their work. Were these snakes disposed, they could destroy the whole of the inhabitants of the earth by a single blast of their poisonous breath; but they are naturally mild and benevolent, and do harm only when provoked. In consequence, they are rather venerated than dreaded; and it is on this account that the common hooded snake is so much respected.'

so characteristic of the serpents, is but in a comparatively small degree possessed by this species; the most protracted starvation amounts to a period of about one month; while the *Vipera elegans*, the *Naja tripudians*, and the *Bungarus annularis*, have, without inconvenience, been confined in cages without any food for more than ten months. Two specimens of the *Hamadryas* in my possession were regularly fed by giving them a serpent, no matter whether venomous or not, every fortnight. As soon as this food is brought near, the serpent begins to hiss loudly, and, expanding the hood, rises two or three feet; and retaining this attitude, as if to take a sure aim, watching the movements of the prey, darts upon it in the same manner as the *Naja tripudians* does. When the victim is killed by poison, and by degrees swallowed, the act is followed by a lethargic state, lasting for about twelve hours. Such of the other Indian venomous serpents, the habits of which I have had opportunity to study from life, show themselves much inclined to avoid other serpents, however ready they are to attack men or animals when provoked or driven by hunger; and I am not aware of any other of those serpents being recorded as preying upon its own kind. A short time ago however, during my sojourn at the Cape of Good Hope, I received from high authority the following fact, which throws a light upon the habits of the *Naja* of Southern Africa, one of which, when being captured, threw up the body of a *Vipera arietans* (*Vip. brachyurus*, Cuvier), which bore marks of having been submitted to the process of digestion.

'The *Hamadryas*, like the greater number of Indian serpents, evinces a great partiality to water; with the exception of the tree-serpents (*Leptophina*, Bell), they all not only drink, but also moisten the tongue, which, as this organ is not situated immediately in the cavity of the mouth, become in the serpents two different acts.* Specimens of this serpent in my possession changed the skin every third or fourth month, a process which takes place in all the Indian serpents several times during the year. The *Hamadryas* is very fierce, and is always ready not only to attack, but to pursue, when opposed: while the *Cophias*, the *Vipera*, the *Naja*, and the *Bungarus*, merely defend themselves; which done, they always retreat, provided no further provocation is offered. The natives of India assert that individuals are found upwards of twelve feet in length, a statement probably not exaggerated, as I have myself seen specimens from eight to ten feet in length, and from six to eight inches in circumference. I have often heard it asserted that "Cobras" (which name is naturally enough given to every hooded serpent) have been met with of an enormous size, but I strongly doubt their belonging to the genus *Naja*: among a considerable number which have come under my observation, I never saw any exceeding five to six feet in length, while the common size is about four feet. Some time before I discovered the *Hamadryas*, I was favoured by J. W. Grant, Esq., of the Hon. Company's Civil Service, with an interesting description of a gigantic hooded serpent he had observed in the upper provinces, and which, he remarked, was not a *Naja*. By inspection this gentleman denied the *Hamadryas* to be identical with the above-mentioned.

'The natives describe another hooded serpent, which is said to attain a much larger size than the *Hamadryas*, and which, to conclude from the vernacular name, "*Mony Choar*," is perhaps another nearly allied species.†

'The fresh poison of the *Hamadryas* is a pellucid tasteless fluid, in consistence like a thin solution of gum arabic in water; it reddens slightly litmus paper,‡ which is also the case with the fresh poison of the *Cophias viridis*, *Vipera elegans*, *Naja tripudians*, *Bungarus annularis*, and *Bung. cœruleus*: when kept for some time it acts much stronger upon litmus; but after being kept it loses considerably, if not entirely, its deleterious effects.

'From a series of experiments upon living animals, the effects of this poison come nearest to those produced by that of the *Naja tripudians*, although it appears to act less quickly. The shortest period within which this poison proved fatal to a fowl was fourteen minutes, whilst a dog expired in two hours eighteen minutes after being bitten. It should however be observed that the experiments were made during the cold season of the year.'

A specimen of the present genus (*Hamadryas*), in the Collection of the Society, was upon the table, having been presented to the Museum by Sir Stamford Raffles, but without any facts respecting its history, or the locality in which he had procured it. (*Zool. Proc.*, 1838.)

For an example of the African species see ASP. It is worthy of observation with reference to the contest in the presence of Pharaoh between Moses and Aaron and the magicians of Egypt (*Exodus*, vii. 9-12), that it is stated, on good authority, that the modern Egyptian jugglers possess the power of throwing the Asp (*Naia Haje*) into a state of catalepsy, and rendering it stiff and immoveable, in other words, changing it into a rod, by pressing the nape with the fingers.

NAI'ADES, or NAYADES, Lamarck's name for a family of fresh-water conchifers (*Naiadæ*), comprising the genera *Unio*, *Hyria*, *Anodonta*, and *Iridina*. The third of these genera has been of late years more correctly named Anodon. Dr. Leach and Mr. Bowdich first made this alteration, and they have been followed by most English zoologists. The genus *Unio* was first established by Bruguière.

The position which the genera constituting this family occupied in the systems of the leading zoologists will be seen by a reference to the article MALACOLOGY. Other genera were added by authors, to which it will not, at present, be necessary to advert. Mr. Swainson, in the first series of his interesting 'Zoological Illustrations,' some time ago observed, that having paid some attention to the fluviatile bivalves, and possessing a most extensive collection of specimens, he was clearly of opinion that no permanent characters will be found sufficient to retain either the genera *Dipsas*, Leach, *Hyria*, Lamarck, or *Alasmodonta*. Say, 'much less,' continues Mr. Swainson, 'that of *Damaris*, Leach, and another, whose name I forget, made by Dr. Turton* from the same shell as Leach's *Damaris*, viz. *Mya Margaritifera* of Linnæus. In fact, the line of demarcation between *Unio* and *Anodon* appears to rest on the first possessing cardinal teeth, and the latter having none.' In the second series of his 'Zoological Illustrations' Mr. Swainson gives the following synopsis of the genera—*Unio*, *Hyria*, *Iridina*, *Anodon*, *Alasmodon*.

The North American rivers abound with this family; and Mr. Lea of Philadelphia has contributed most largely to our knowledge of the habits of these animals, and has made great additions to the species. The result of his labours, as regards classification, we shall presently show.

Reproduction, Habits, Organization, &c.—Mr. Lea, in his 'Preliminary Remarks,' notices Lamarck's statement that the animal of *Anodon*, which is essentially the same with that of *Unio*, is hermaphrodite, and seems viviparous; for the eggs pass into the oviduct placed along the superior branchiæ, where the young are found with their shells complete. Mr. Lea then tells us that he dissected a specimen of *Anodonta undulata* nearly three inches long, and found the oviducts charged with about 600,000 (as nearly as he could calculate) young shells perfectly formed, both valves being distinctly visible with the microscope. In his second volume bearing the title of 'Observations on the Genus Unio,' &c., the same author informs us that, believing that the oviducts would present the means of discrimination in some species, he having found them to be so very different in *Unio irroratus*, his attention had been particularly addressed to these organs in the few and small species of his vicinity. Whilst engaged in this investigation, Dr. Kirtland, of Poland, Ohio, informed Mr. Lea of his ability to distinguish the female and male shells of the same species, without having recourse to the included animal; and, shortly afterwards, Dr. Kirtland's paper on the subject appeared in the 'American Journal of Science and Arts,' vol. xxvi. Mr. Lea's attention now became more addressed to sexual characters, and he states that a very short series of exami-

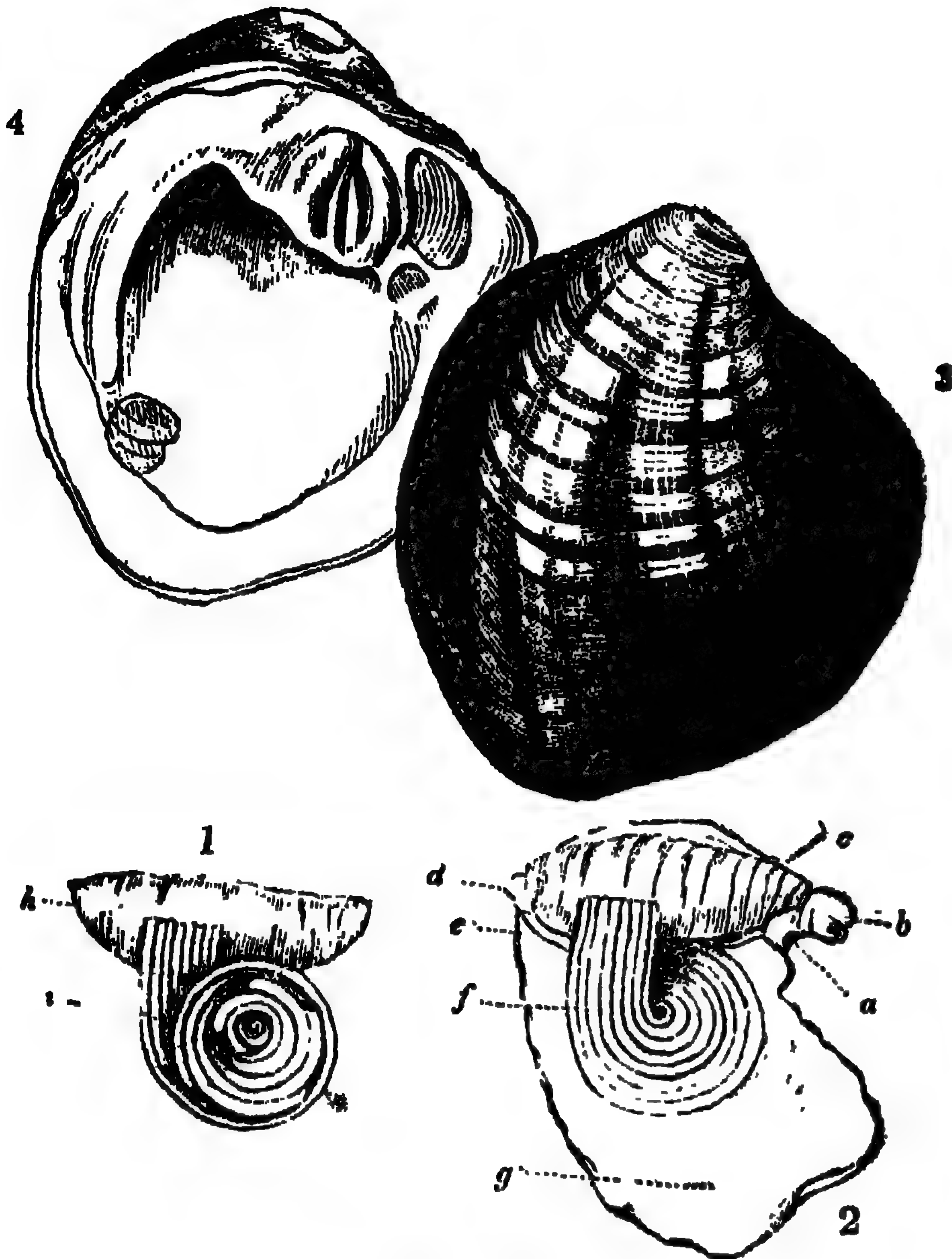
* M. Schlegel is of opinion that serpents never drink. (*Essai sur la Physiogn. des Serpens, Partie Générale.*) As mentioned above, I have had opportunities of ascertaining that the greater number of Indian serpents are very fond of water, a fact which I am aware has also been observed in the African serpents by the eminent naturalist Dr. A. Smith, whose valuable discoveries, which he is at present engaged in publishing, will bring to light many facts, of which we are at present in almost total ignorance, concerning the habits of animals, particularly those of the Reptiles.

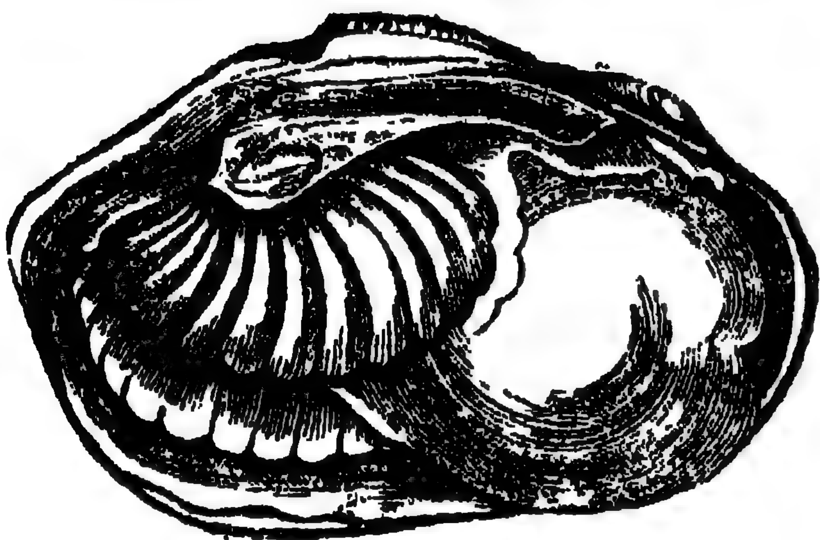
† The Cobra Capello described by Captain Percival (ante, p. 62) may have been one of these gigantic hooded serpents.

‡ 'M. Schlegel asserts (loc. cit., p. 84) the venom is "ni alcalin ni acide." The only way in which I can account for this mistake from a man who ranks among the first Erpetologists, is by supposing that M. Schlegel himself never had an opportunity of testing the poison of a living serpent; for besides the five above-mentioned genera of Indian venomous serpents, I found the fresh poison of different species of marine serpents (*Hydrus*) to possess the property of turning litmus paper red. The same fact with the *Crotalus* is noticed by Dr. Harlan, who says, "The poison of the living *Crotalus*, tested in numerous instances with litmus paper, &c., invariably displayed acid properties." (Vide Harlan, *Medical and Physical Researches*, p. 501, sq.)'

* Mysca?

nation satisfied him fully as to the establishment of the difference of sexes. The female, sustaining her very large burthen, naturally requires, he observes, more space within the valves; hence an enlargement of the posterior portion of the shell is generally found, differing in its form in various species. The following figures, representing the oviducts of the species whose names are printed under the cuts, are given by Mr. Lea.

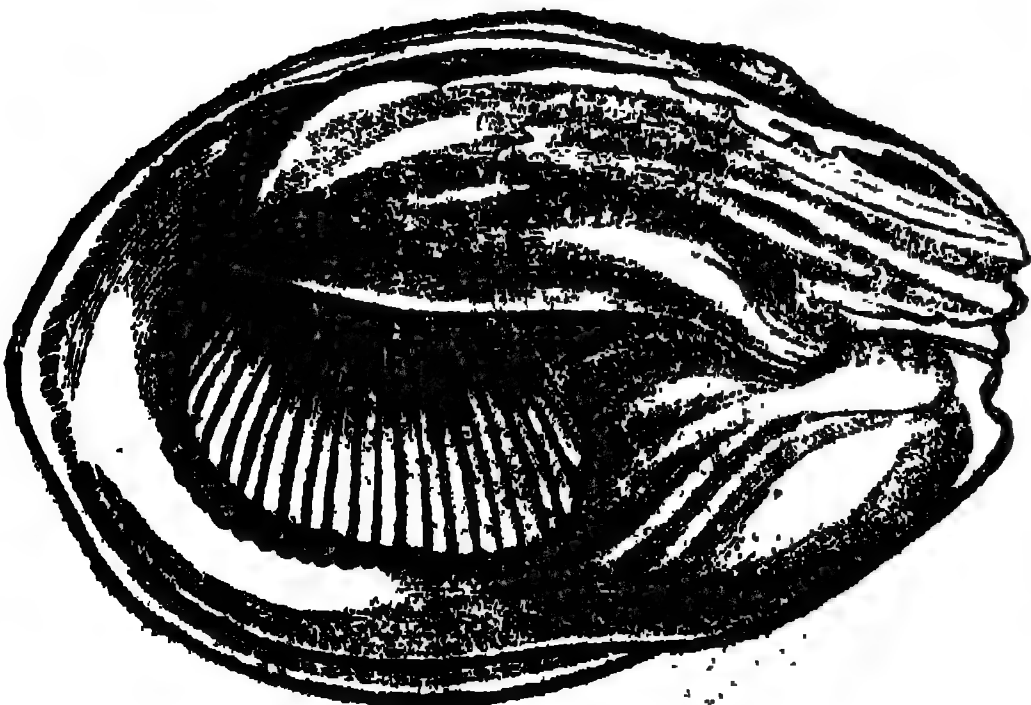




Unio Irroratus.

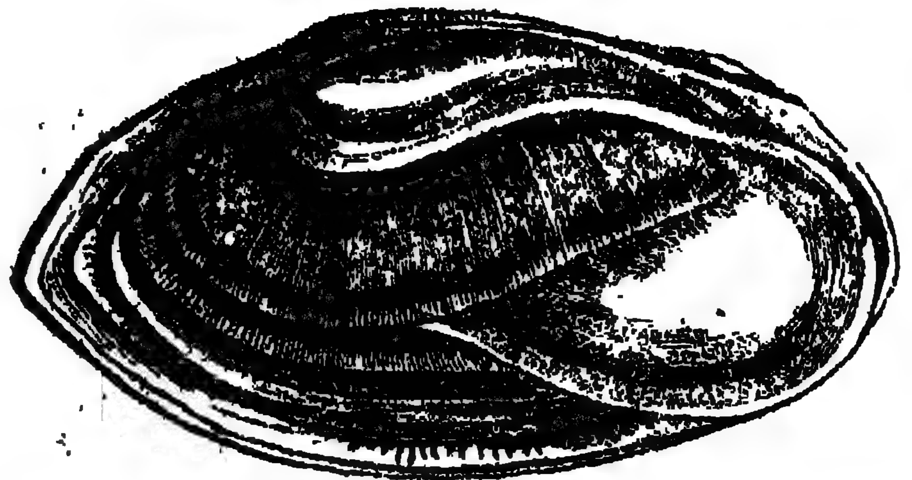
1, soft parts showing interior of oviduct; 2, showing exterior of oviduct, the mantle being removed; *a*, mouth; *b*, great anterior muscle; *c*, right superior branchia; *d*, great posterior muscle; *e*, inferior right branchia; *f*, right oviduct; *g*, foot; *h*, superior left branchia; *i*, interior view of oviduct; 3, 4, shell.

Appearances exhibited by female Naiades according to Mr. Lea, one of the valves removed and the oviducts exposed.



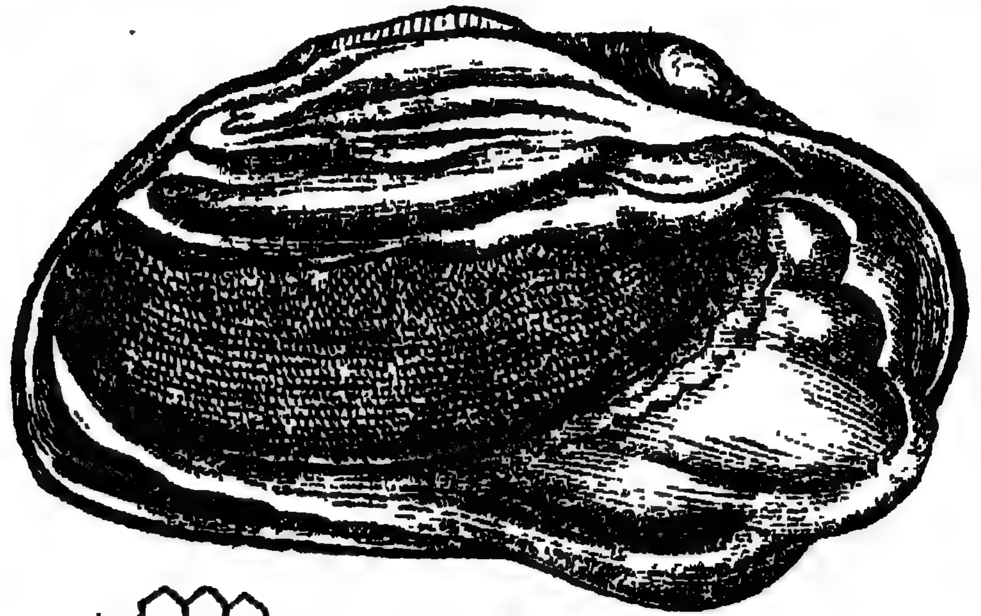
Unio Ochraceus.

Unio Cariosus.



Anodonta Fluviatilis.

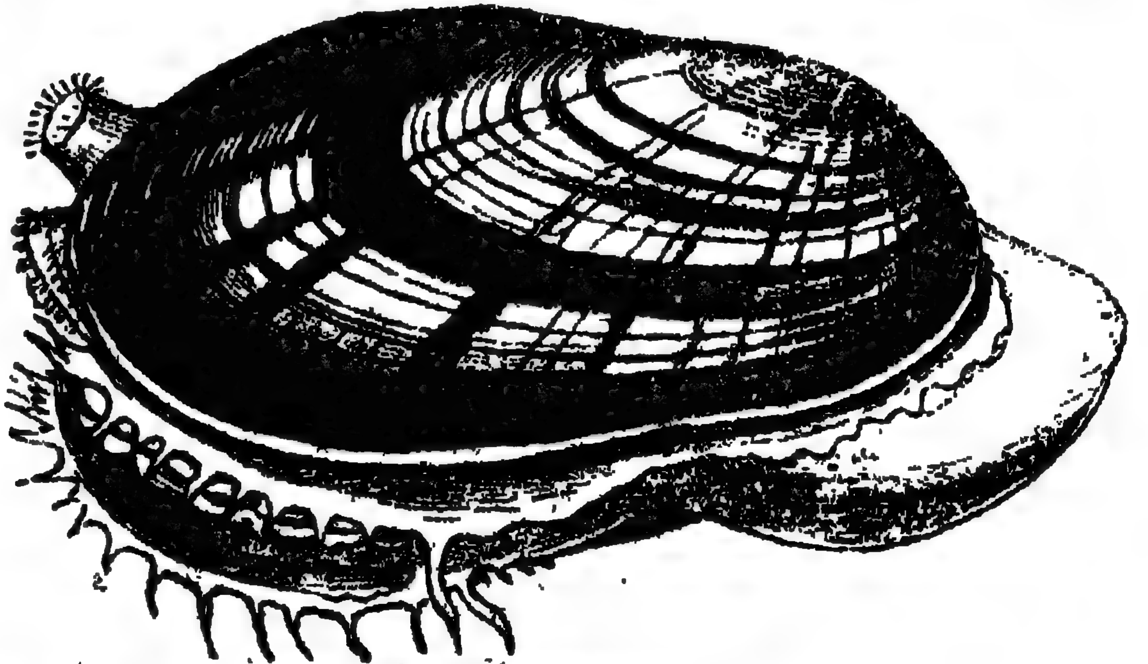
In plate xx. (Mr. Garner's paper on the 'Lamellibranchiate Conchifera') will be found a figure of the animal from the ovarium of an *Anodonta*, as seen in the field of the microscope (¼ inch focus); and in pl. xviii. the disposition of the heart, pericardium, excretory organs, &c., of *Anodonta anatina* is shown.

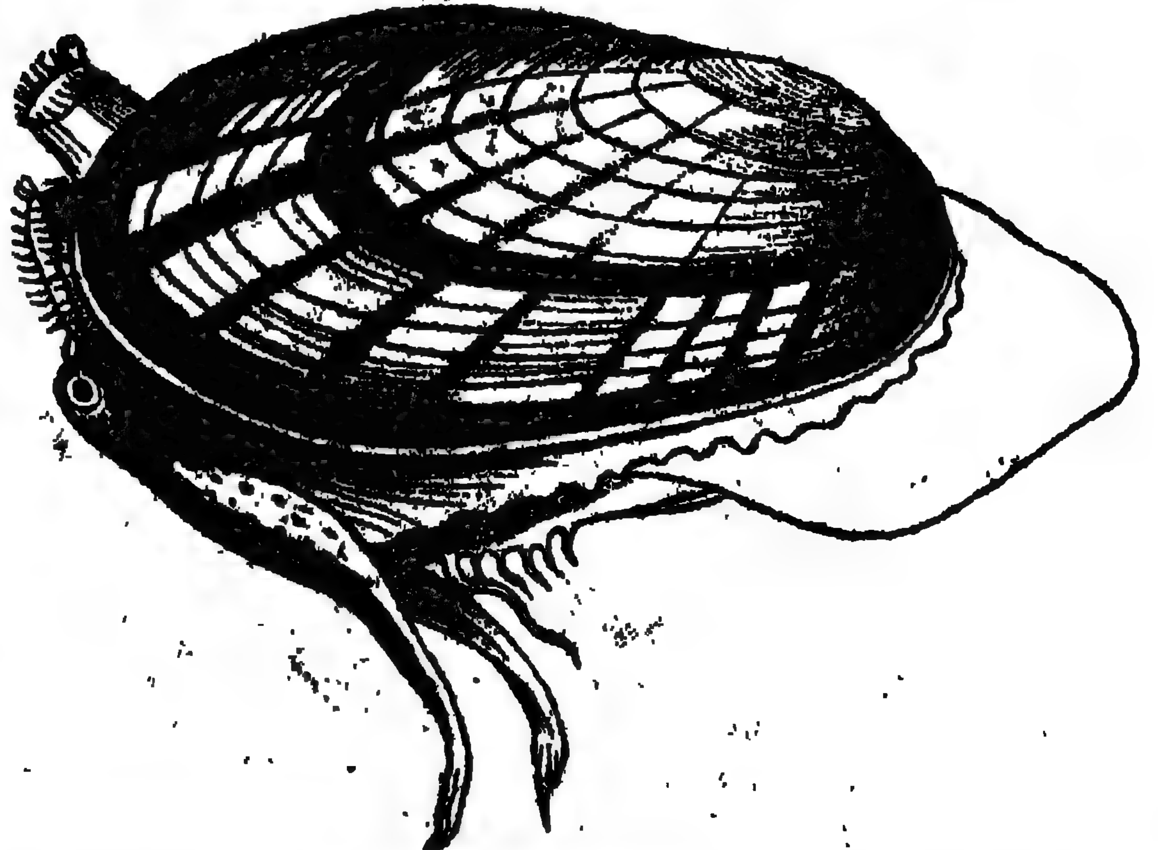




Anodonta Undulata.
Apparently nearly ready to spawn.

Mr. Lea remarks that the mass of the lobes in this species differs from that of *A. fluviatilis*, in presenting a darker appearance and a very curious arrangement of the oviducts. The ova are placed in a kind of sac lying across the lobe, and presenting one end to the stomach and the other to the mantle of the animal. They lie so close together, as to take the form on the exterior, like the cells of a honeycomb This, Mr. Lea says, is of course produced by pressure Some of these sacs, when carefully removed, were found to contain as many as twelve ova, each with a perfect living shell in it, having a brownish epidermis: *a* in the cut repre-





Two females of *Unio radiatus* as they were seen with the parts protruded as they lay at the bottom of a basin of water. Mr. Lea states that these females put on two quite different forms as regards the inferior portion of the mantle, as exhibited above.

sents a sac with its ova, *b* represents the ovum with its perfect young shell included, *c* represents the honeycomb appearance and is eight times magnified.

Mr. Lea (vol. i.) states that it seems to be a matter of doubt on what these animals subsist. He says that he has strong reasons for believing that they feed on animalcules which are ever found to exist in water, and which they might separate from the constant stream which they pass from the posterior part of the shell, and which must be taken in at another part. This operation he witnessed frequently in a vessel in which he kept the *Naiadæ* for some months. If the water was not changed for twenty-four hours, he uniformly found the animals quiet, but within a few minutes after it was changed they as uniformly commenced the passage of this constant stream. He adds that he cannot suppose this operation to be for the sole purpose of breathing, as there is no intermission in the stream of water, and the quantity thrown out is too great for this purpose only. He believes it to be the result of the action of the separation of the animalcules from the water.

In the Museum of the Royal College of Surgeons in London (*Physiological series*) are the following preparations. No. 1002, The soft parts of a fresh-water muscle (*Anodon cygneus*) injected and prepared to show the four branchiæ, which unite below the foot. The convolutions of intestine at the base of the foot and the passage of the rectum through the heart are also shown. No. 1003, The soft parts of a fresh water muscle, with both mantle-lobes and heart dissected away, so as clearly to display the branchiæ and labial processes. The orifice of the branchial vessels and water-tubes are well displayed at the base of the branchiæ. The first series of vessels, which run transversely across the branchiæ, give off lateral ramulets at right angles, and form a most delicate vascular net-work to receive the influence of the respiratory currents. No. 1004, A transverse section of the branchiæ of a fresh-water muscle, injected, dried, and preserved in oil of turpentine: a beautiful display of the vascularity and delicate structure of the respiratory organ. No. 66, A transverse section of the connecting ligament of the valves of a fresh-water muscle, showing that its structure is fibrous, the fibres being perpendicular to the plane of the shell, and converging towards the centre, so that when the shell is closed these fibres are in a state of compression, and consequently have a constant tendency to antagonize the adductor muscle, open the shell, and retain it in that state, independent of any muscular action. No. 67, A longitudinal section of the same ligament, made by dividing the valves from one another.

The brilliant and variously coloured nacre with which many of the species are lined and the extreme thickness of some of the shells are very remarkable. That pearls should be found in them will not surprise those whose attention has been drawn to their internal surface. Pennant remarks that *Mya Margaritifera* of Linnæus (*Unio elongatus*) is noted for producing quantities of pearls, and formerly there were regular fisheries in many of our rivers to obtain them. As many as sixteen have been taken from one shell. The Esk and the Conway were famous in this way. The latter river, in the days of Camden, was noted for them. Sir Richard Wynn of Gwydir, chamberlain to Catherine, queen to Charles II., is said to have presented her majesty with a Conway pearl which is to this day honoured with a place in the regal crown. Pennant, who states this, adds, that the shells are called by the Welsh, *Crigen Diluw*, or Deluge Shells, as if left there by the deluge. The river Irt in Cumberland also produced them; and Sir John Hawkins, the circumnavigator, had a patent for fishing that river. Britain indeed had early acquired a reputation for its pearls; for, according to Suetonius, they were Cæsar's inducement for undertaking his British expedition. (*Jul. Cæsar*, c. 47.) This however does not seem very probable. Pliny (ix. 35) indeed speaks of the pearls of our island as small and ill coloured, and refers to the breast-plate which Cæsar himself had brought home and dedicated to Venus Genetrix in her temple, adding that he wished it to be understood that the offering was formed of British pearls.

Ireland has produced pearls of considerable size and some value, especially in the rivers of Tyrone and Donegal. One weighed 36 carats, and was valued at 40*l*., but it was foul, and so lost much of its worth. Other single pearls were sold for 4*l*. 10*s*., and for as much as 10*l*. The last was sold a second time to Lady Glenlealy, who put it into a necklace, and refused 80*l*. for it from the duchess of Ormond. Pennant, who quotes from the abridgement of the 'Phil. Trans.,' speaks of the last century as the time when these large Irish pearls were procured. We have seen some lately of considerable size, fair shape, and pretty good colour.

Mr. Lea, in his final arrangement, admits only two genera, *Margarita* and *Platiris*. The first of these has been preoccupied by Leach to designate a genus of marine conchifers. [MARGARITA.] We shall however retain the name in this article, in order to present to the reader the leading features of Mr. Lea's arrangement and the forms of the shells.

MARGARITA. (Lea.)

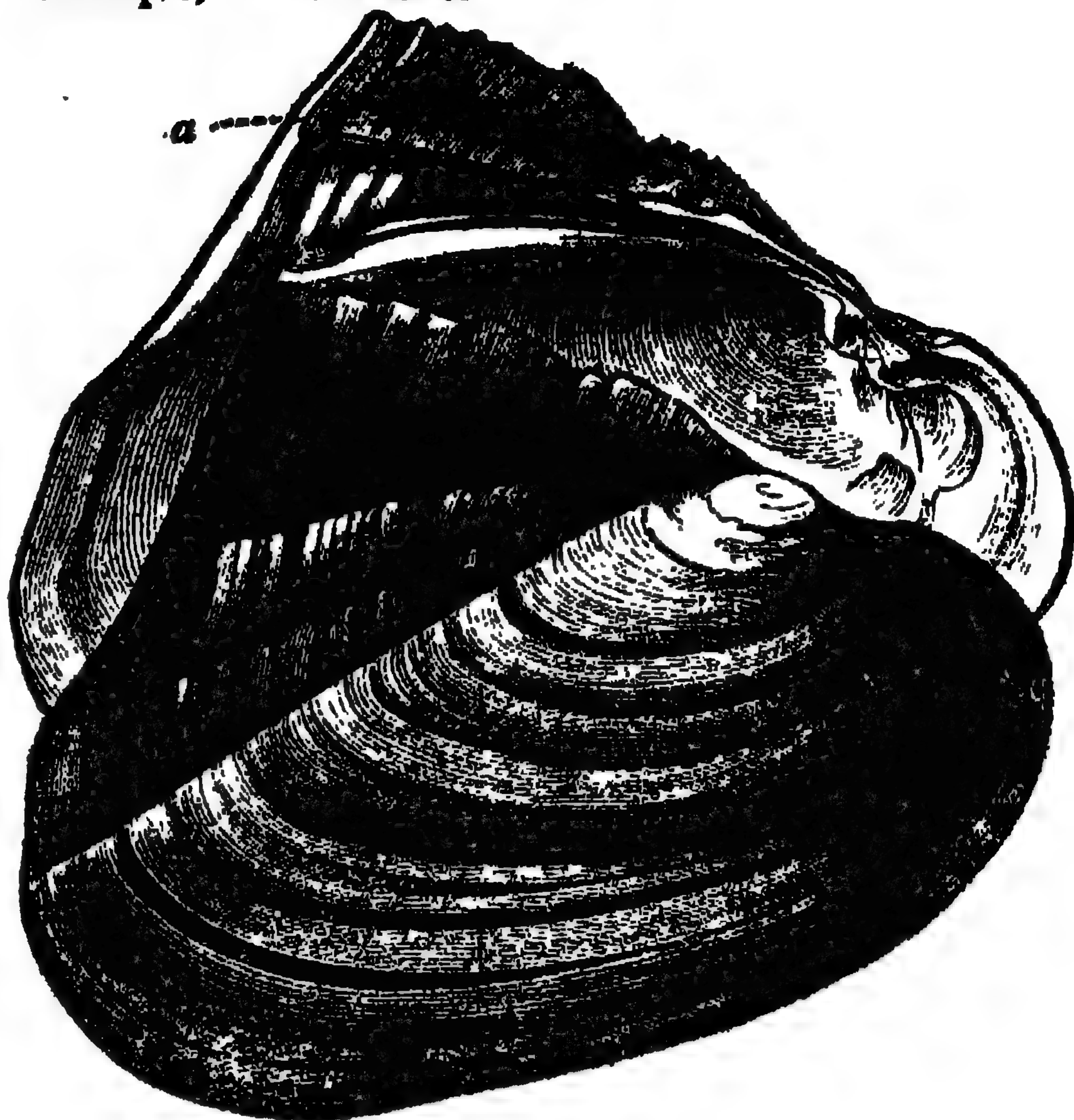
1. Subgenus. Unio.

Having a cardinal and lateral tooth.

*

Symphynote.

Example, *Unio alatus*.



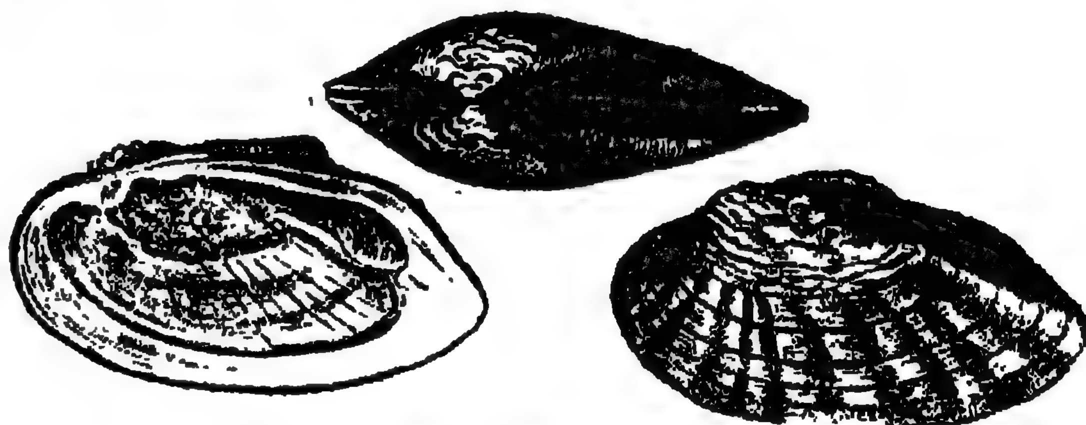
Unio alatus.

a, part of the wing of the valve broken off, showing the symphynote character reduced.

* *

Non-Symphynote.

Example, *Unio Pictorum*, common in our English rivers. shell and animal figured in the article CONCHIFERA, vol. vii., p. 433.



Unio pictorum. (From a young specimen.)

In Mr. Garner's memoir on the anatomy of the Lamellibranchiate Conchifera (pl. xx.) the ova of *Unio Pictorum* from the ovaries and branchiæ are represented (18th of an inch focus). Also the valve of a young *Unio*, showing that its nucleus is of the same shape as the valves of the animals found in the branchiæ.

*

2. Subgenus. Margaritana.

Having one tooth (cardinal).

* *

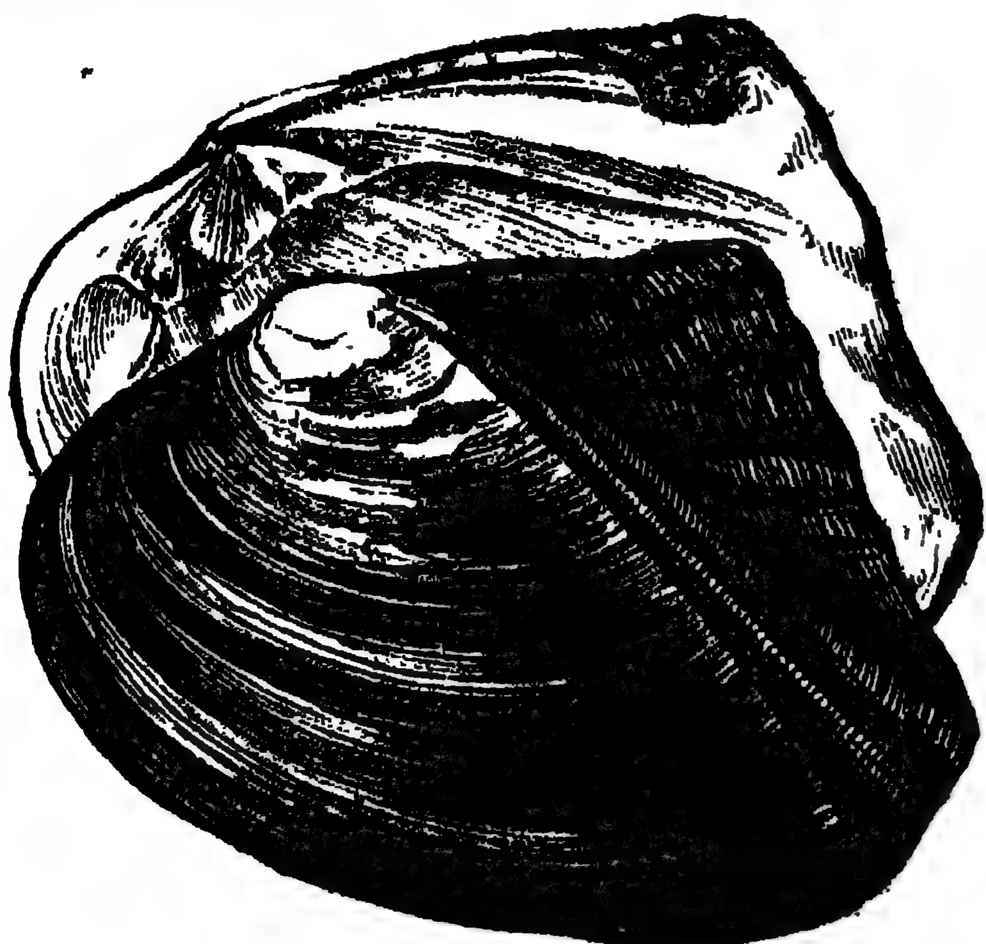
Non-Symphynote.

Example, *Alasmodonta undulata*. (Say.)



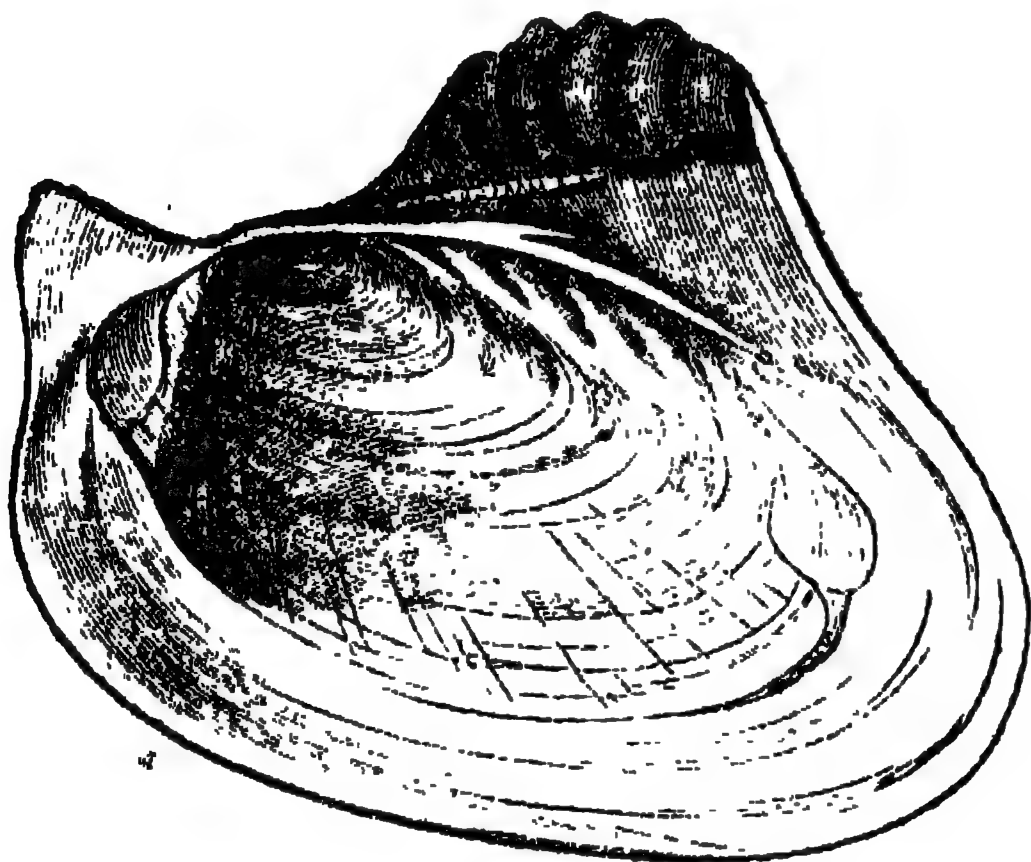
Alasmodonta undulata.

Symphynote.
Example, ***Alasmodonta complanata.*** **(Barnes.)**



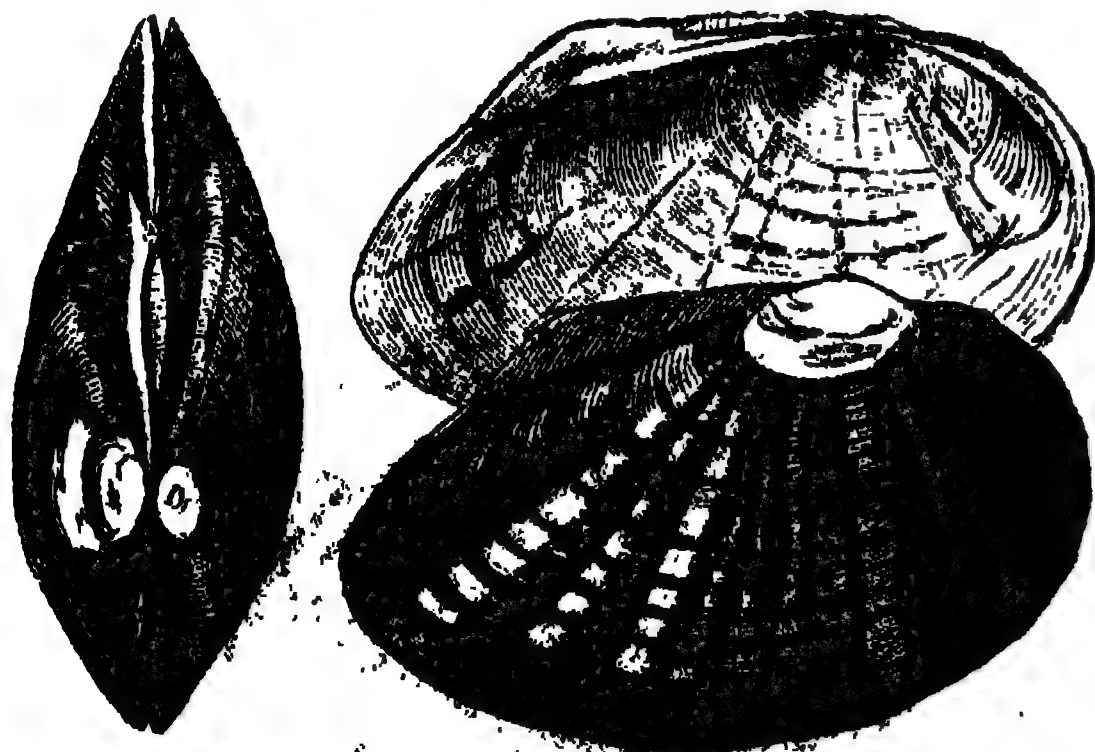
Alasmodonta complanata.

3. Subgenus. Dipsas.
Having a linear tooth under the dorsal margin.
Symphynote only.
Example, ***Dipsas plicatus.*** **(Leach.)**



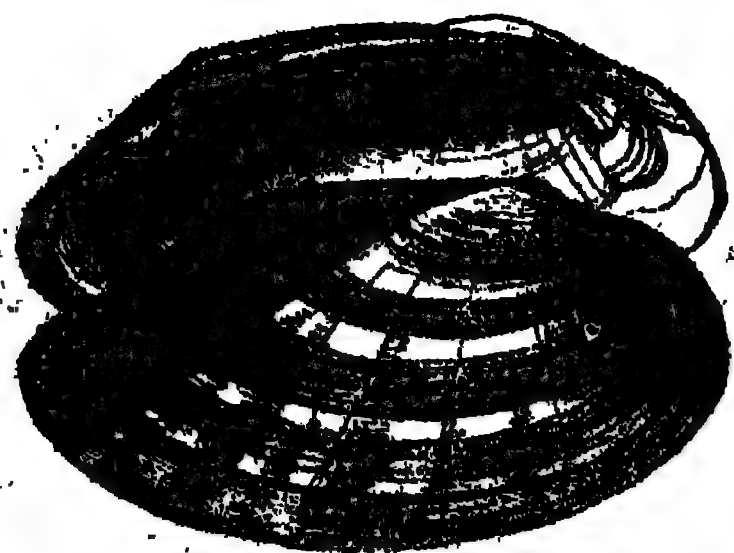
Dipsas plicatus.

4. Subgenus. Anodonta.
Having no teeth.
Symphynote.
Example, ***Symphynota magnifica.*** **(Lea.)**



Symphynota magnifica.

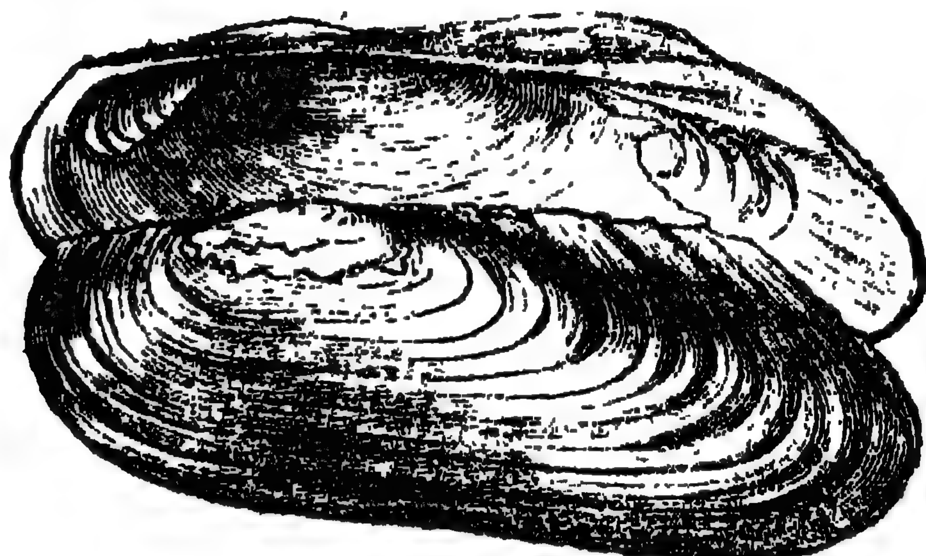
Non-Symphynote.
Example, ***Anodonta fluviatilis*** **(Mytilus fluviatilis of Solander, Dillwyn, &c; Anodonta cataracta of Say).**



Anodon fluviatilis.

PLATIRIS. (Lea.)
1. Subgenus. Iridina.
Having a crenulate dorsal margin.
Non-Symphynote.
Example, ***Iridina exotica.*** [See CONCHACEA, vol. vii. p. 426.]

2. Subgenus. Spatha.
Having the dorsal margin non-crenulate.
Non-Symphynote.
Example, ***Iridina Nilotica.*** **(Sowerby.)**



Iridina Nilotica.

Plicate Shells.
Example, ***Unio plicatus.*** **(Lesueur.)**



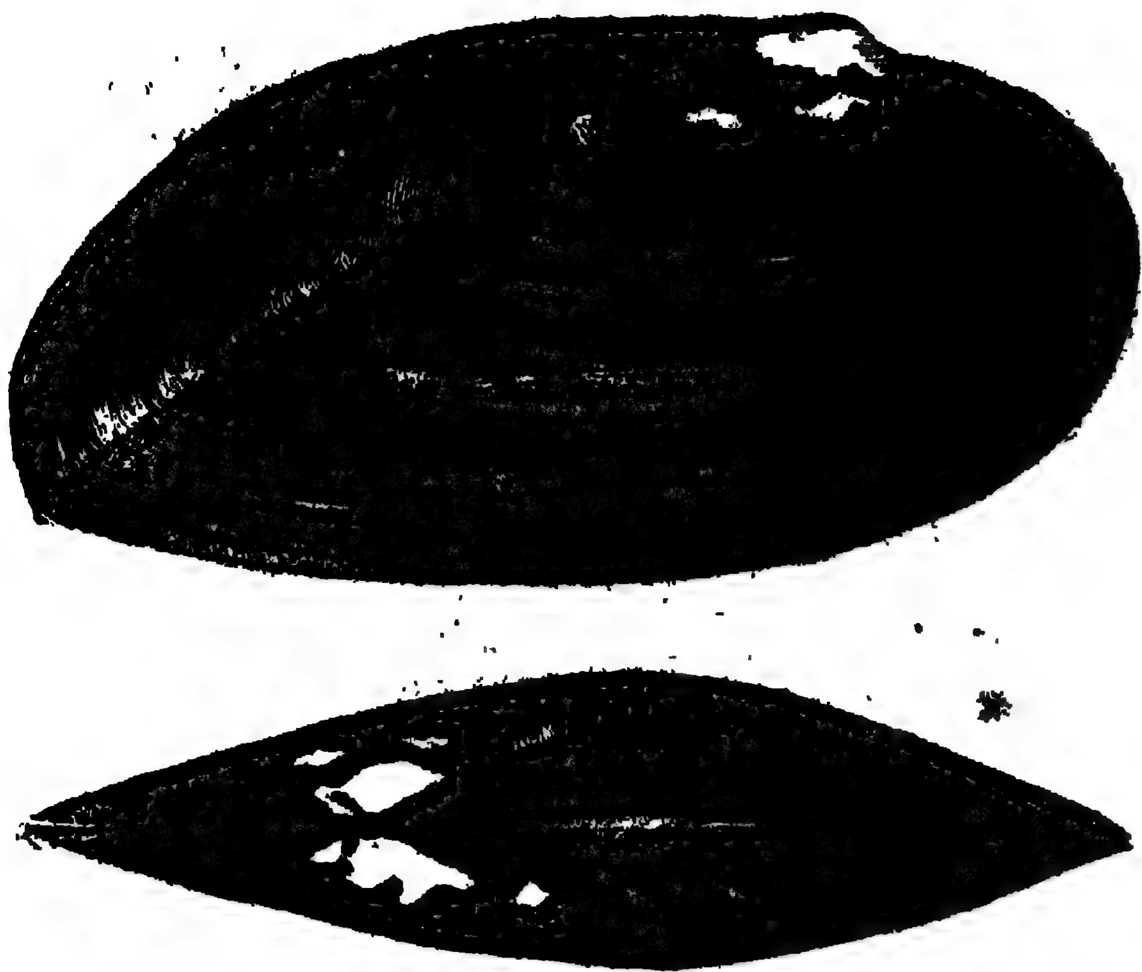
Unio plicatus.

Nodulous Shells.
Example, ***Unio pustulosus.*** **(Lea.)**



Unio pustulosus.

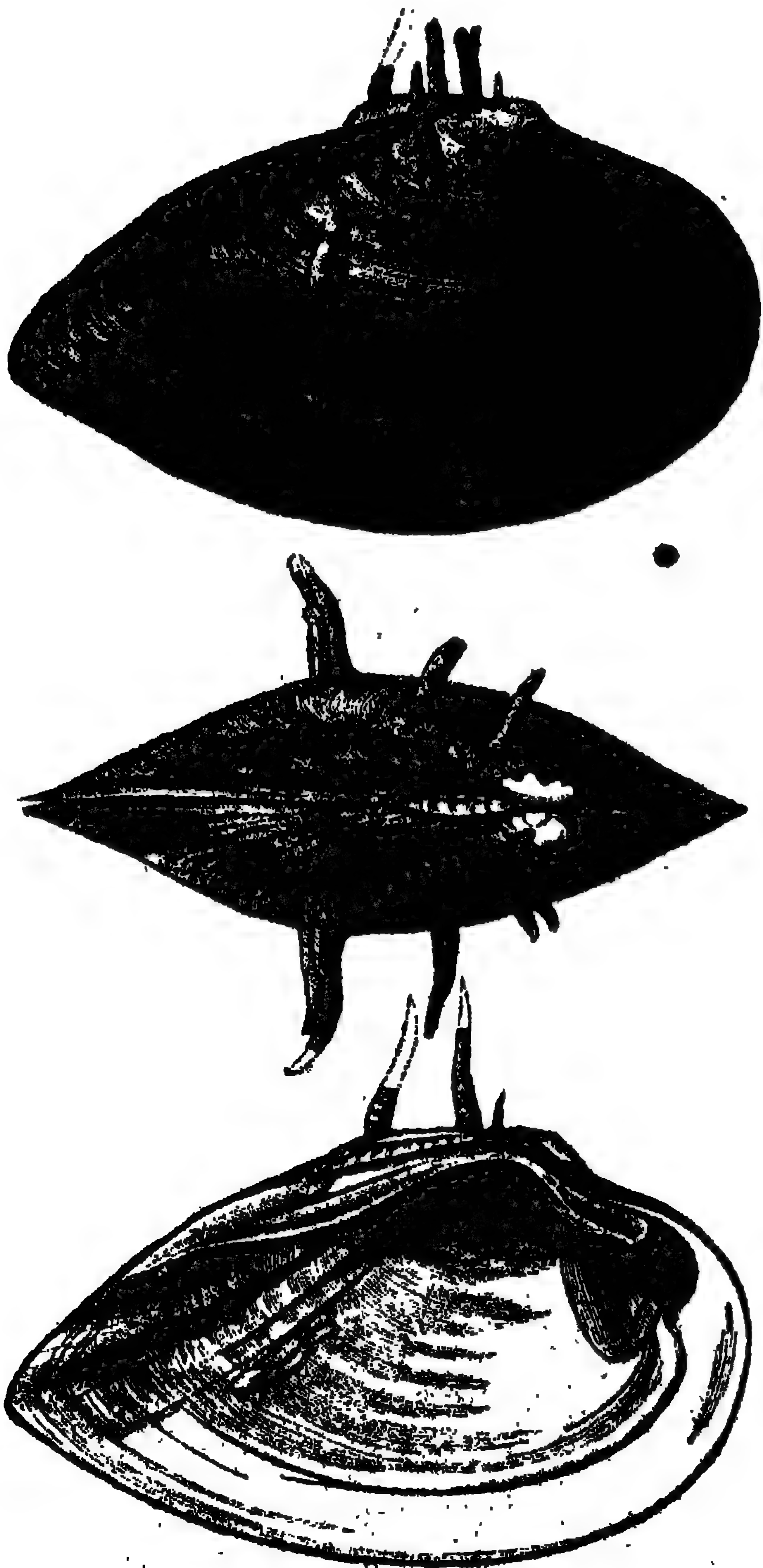
Smooth Shells.
e, ***Unio complanatus*** **(Unio purpureus, Say).**



Unio purpureus.

Spinous Shells.

Example, *Unio spinosus* (Lea). N.B. Bartram appears to have been the first who discovered this species. He, apparently, found it in the Mississippi. See his 'Travels,' p. 431.



Unio spinosus.

Mr. Lea, in his Tables, enumerates 323 recent species as admitted, and 29 as unknown to him or doubtful.

Of the subgenus *Unio*, 235 recent, and 20 which he has not been able to admit as certain. (Europe, Asia, Africa, North America, South America, New Holland. By far most abundant in North America.)

Margaritana, 20 admitted, 2 unknown. (Europe, North America, South America, and perhaps Africa.)

Dipsas, 2 recent. (Asia.)

Anodonta, 58 admitted; 7 unknown to Lea. (Europe, Asia, Africa, North America, South America, New Holland.)

Iridina, 2 recent. (Africa.)

Spatha, 6 recent. (Africa, South America.)

M. Deshayes (last edition of Lamarck), after reviewing the state of the question, comes to the conclusion that all the various genera cannot form and ought not to form more than one genus, constituting singly the family of the *Naiadæ*. He refers to Mr. Lea's work favourably, but charges him with an omission which would have been almost unpardonable in an author who had undertaken a monograph of this extensive family. It is but common justice to Mr. Lea to insert his conclusive answer to this charge: 'I will be excused,' says Mr. Lea, 'in taking this opportunity to correct an erroneous impression on the mind of M. Deshayes. He says that I was not able to examine the collection of the museum of Paris. "Malgré cette imperfection qu'il ne pouvait empêcher, le travail de M. Lea se recommende à l'attention des naturalistes par des observations judicieuses, des descriptions exactes," &c. It would be strange indeed if, after spending so many years in the study of this family that I should neglect, while in Paris, to see the collections from which Lamarck made so many descriptions. I was frequently at the museum, and, on one particular occasion, by appointment of MM. Blainville and Férussac, arranged, in the presence of these and other gentlemen, all the species of the *Naïades* that were in the museum, and named them; and also presented to the museum about 15 species which were new to that great national institution. I also did the same thing for Baron Férussac, having designated every specimen in his cabinet belonging to this family.'

FOSSIL NAIADÆ.

Speaking of *Anodon*, Mr. G. B. Sowerby (*Genera*) says that he does not know of any fossil species, unless we are justified in considering the bivalve from the coal-measures figured in Sowerby's 'British Mineralogy,' tab. 386, under the name of *Mytilus crassus*, as an *Anodon*. This Mr. G. B. Sowerby states he is unable, after examining the specimens, to demonstrate, though he finds strong reason for believing that it may prove so. When treating, in the same work, of the genus *Unio*, the author states that there are many fossil shells, particularly in the coal-measures, which are referred to this genus; and, he thinks, correctly so, though he has never been able to consult the characters of the hinge; but, judging from the cast of the inside, which is very common, he finds no difference between it and casts that he made from the inside of recent *Uniones*. He does not however feel authorised to pronounce the shell published in *Min. Con.*, t. 153 (*Unio crassissimus*), to be an *Unio;* for its hinge, he observes, is far from being characteristic, and it has not the compound muscular impression of that genus. He thinks that it agrees more nearly with some of the Lamarckian *Cypricardiæ;* at the same time he confesses his doubts about the probability of that genus being ultimately adopted. His attention appears to have been next drawn to *Unio Listeri*, *U. hybridus*, *concinnus*, and others figured in *Min. Con.*, and placed in the oolitic series by Conybeare and Phillips; and, in confirmation of some of the observations recorded in their 'Outlines,' he remarks that these, together with *Unio crassiusculus* (*Min. Con.*, t. 185), all want some of the principal distinguishing marks of the *Unio*, and, judging even from their hinges, he remarks that we should certainly hesitate to place them with *Unio*. He adds that he has never seen any perfect specimen of the shell published as *Unio*, from the freshwater formation; but if he may be allowed to decide from such fragments as he had examined, and from its geological position, he should hardly feel a doubt upon the subject. Notwithstanding however what he has above advanced, he concludes by observing that he must still consider the existence either of *Unio* or *Anodon* in any bed below the chalk, except the coal-measures, as exceedingly problematical. M. Deshayes (*Tables*) makes the number of fossil species of *Unio* (tertiary), 2; of *Anodon*, 1; of *Hyria*, none; and of *Iridina*, none. In the last edition of Lamarck he records 2 of *Unio*—*U. concinnus* (Sow.), from the inferior oolite near Banbury, in Oxfordshire, and *Unio hybridus* (Sow.) from the Nottinghamshire beds; both from *Min. Con.* Dr. Mantell records a *Unio* (*Brit. Min.*, t. 500) from the

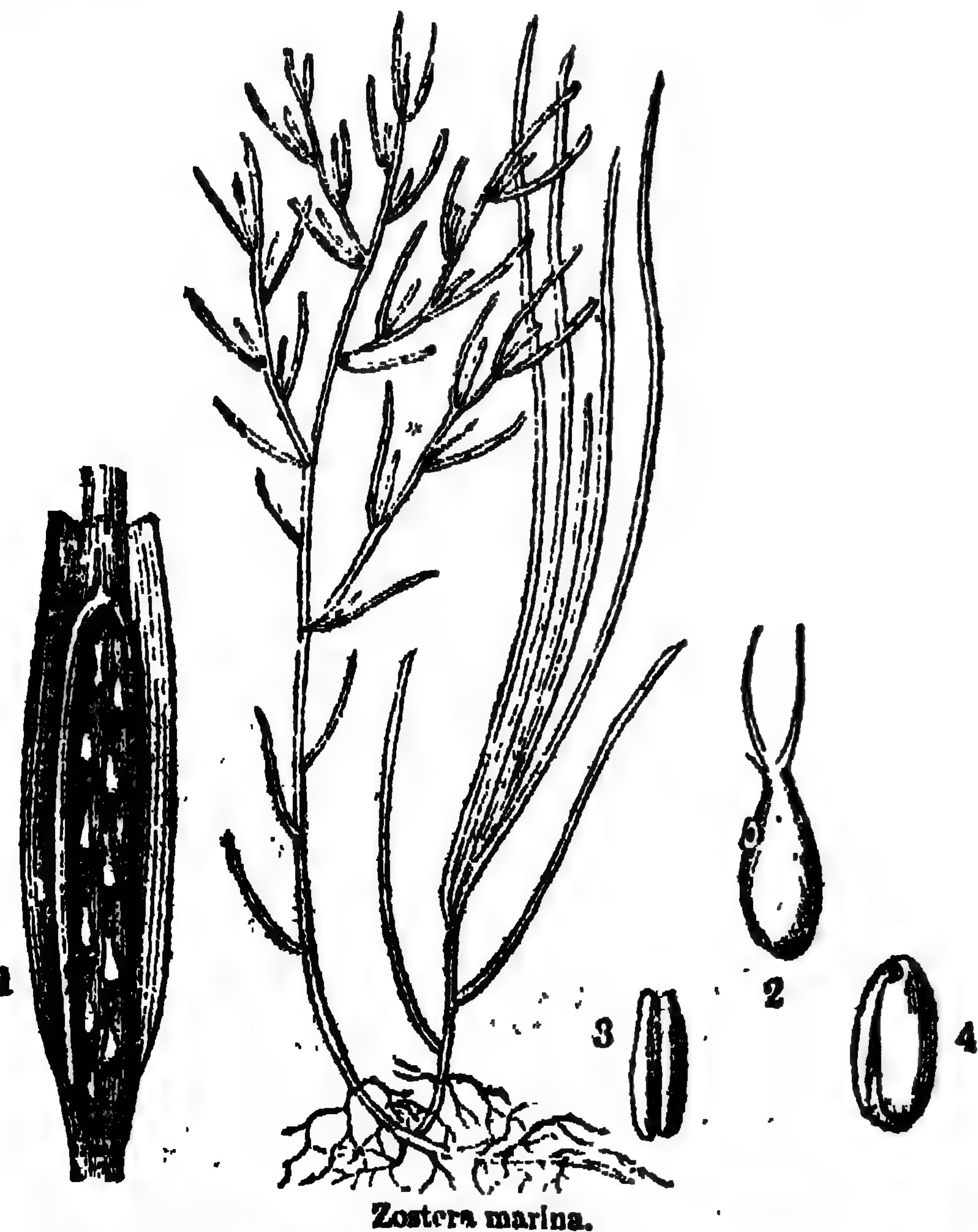
plastic clay (Castle Hill, near Newhaven), and *Uniones porrectus, compressus, antiquus, aduncus*, and *cordiformis*, from the Tilgate beds (middle division). Also *Unio antiquus* from the Ashburnham beds (lower division of the Hastings deposits). Professor Phillips (Yorkshire) enumerates *Uniones Listeri, concinnus*, and *crassiusculus*, from the lias; *peregrinus* from the cornbrash; and *abductus* from the inferior oolite and marlstone. Mr. Lonsdale (oolitic district of Bath) records *Unio concinnus* from the alluvium (Weston) and from the inferior oolite (Widcombe Hill); and an unnamed *Unio?* from the Kelloways rock (Christian Malford). Dr. Fitton, in his table (*Strata below the Chalk*) notes *Uniones aduncus, antiquus, compressus, cordiformis, Gualterii, Mantellii, Martini, porrectus, subtruncatus*, a species not distinct, a large new species, and some other species probably new, from the Weald clay, Hastings sand, and Purbeck beds. Mr. Lea gives 21 as the number of fossil *Uniones*, and one (doubtful) of *Anodon*.

*** The last-named author, in his arrangement founded on the form of the hinge, has deemed it better not to adopt D'Orbigny's genus *Mycetopoda* [MYCETOPODA] established on the natural character of the animal. In its perforating habit it resembles, according to Mr. Lea, his *Unio oriens*, which buries itself about 12 inches below the surface of the sand in which it lives.

The genera *Diplodon, Triplodon*, &c. of Spix can hardly be allowed to stand.

NAI'ADES otherwise called *Naiadeæ* and *Fluviales*, are aquatic plants forming a small natural order of Endogens, remarkable for the unusual simplicity of their organization. As they live constantly below water, they require no epidermis, and therefore the leaves consist of nothing more than the mesophlœum, or central stratum of parenchyma. Their sexes are usually separate, and sometimes on different plants. Their floral envelopes are either deficient or in the form of a membranous tunic or cup, or consist of scales, to the face of which anthers or carpels adhere. The latter are either solitary or in pairs or fours, one-seeded, one-celled, with the ovule generally pendulous from the central suture. Their fruit is usually indehiscent and nut-like, but sometimes it is 2-valved or irregularly ruptured. The embryo has *no* albumen, and consists of a very large radicle, usually folded up, and containing a slender plumule lying in the cavity so formed.

These plants are inconspicuous objects, inhabiting both fresh and salt water in all parts of the world. In this country, the genera Potamogeton, a common inhabitant of rivers and ponds, elevating its little brown spikes of flowers above water during the time of fertilization; Zannichellia, a thread-shaped plant, with minute axillary flowers, constantly submersed; and Zostera, or sea-wrack, with long, narrow, riband-like leaves, inhabiting æstuaries of the sea, are the most common.



Zostera marina.
1, a spathe containing male and female flowers; 2, a female; 3, an anther; 4, an embryo.

NAIA'DS (Ναιάδες, Νηΐδες) were female deities in the Greek and Roman mythology, who were supposed to preside over rivers, brooks, and springs. They are represented as young and beautiful nymphs (Hom., *Od.*, xiii. 103), of whom Ægle, according to Virgil, was the most lovely (*Ecl.*, vi. 21). Many of the heroes of the Homeric poems are described as the offspring of Naiads.

According to Pausanias (viii. 4, § 2), the Naiads were called, by the Arcadians, Dryades and Epimeliadæ. [NYMPHS.]

NAIRN. [NAIRNSHIRE.]

NAIRNSHIRE, a small county in the northern highlands of Scotland. It is bounded on the north by Moray Frith, on the east by Elginshire, on the south-east by a detached portion of Inverness-shire, on the south by a detached portion of Elginshire, and on the south-west and west by Inverness-shire. It is situated between 57° 21′ and 57° 39′ N. lat., and between 3° 40′ and 4° 5′ W. long. Its form is irregular; the greatest length is, from north by east to south by west, from the eastern extremity of the coast to the neighbourhood of Cairn Glaschurn and the Leonach hills, 20 miles; the greatest breadth, at right angles to the length, is, from the neighbourhood of Culloden Muir to the neighbourhood of Loch-an-Tulloch in Elginshire, sixteen miles. The area of the county is given by Dr. Playfair (*Description of Scotland*) and by Mr. MacCulloch (*Statistical Account of the Brit. Empire*) at 198 square miles; the population, by the census of 1831, was 9354. Two detached portions belong to the county, the district of Ferintosh or Fairntosh, near Dingwall in Ross-shire, and Dunmaglass in Inverness-shire. These detached parts are not, we believe, comprehended in the measurements given above; but the population is included in the foregoing number. It is one of the least of the Scottish counties in extent, and is exceeded in population by all the others, except Kinross and Selkirk, and perhaps Cromarty, the population of which is not distinguished in the Return from that of Ross.

The southern part of the county is hilly; the hills form two irregular groups, separated by the river Findhorn, which flows through the county. The principal summits are Ben Bui, Cairn Our, Craigerachan, and the Leonach, all on the border towards Inverness-shire; Cairn Glaschurn and Cairn Dui, on the border toward Elginshire. The valley between the two groups of hills in which the Findhorn flows is called Strathdern. Along the coast, which extends about eight miles from east by north to west by south, is a narrow border of level country extending inland from one to six miles. The hill country belongs to one of the least interesting and least frequented parts of the highlands.

The principal rivers are the Findhorn and the Nairn, which both rise in Inverness-shire, and flow through the county in a north-east direction. The Nairn has about eleven miles of its course within or upon the border of Nairnshire, and falls into the Moray Frith at the burgh of Nairn. It is a stream of little consequence; its mouth forms an indifferent harbour, and the salmon-fishery in its waters is of no great value. Its name in the Celtic language is *Uisg Nearne*, 'the water of alders;' from this has been derived its usual designation, which it has communicated to the burgh, and through it to the shire. The Findhorn has about eleven miles of its course in this county, through which it passes to enter Elginshire, where it has its outfall. A number of small streams flow into these rivers, especially into the Findhorn. There are a few small lakes or lochs. The largest is the Lake of the Clans, about a mile long and half a mile broad, about four miles south-west of the burgh of Nairn; Cranloch, near the eastern extremity of the coast, is rather longer than the Lake of the Clans, but not quite so broad. The other lakes are much smaller.

The mineral treasures of the county are not great. There is abundance of marl, which is valuable for manure, but is little used. Expectations were once entertained of finding coal. A quarry of dark blue stone, which is inflammable, is worked; it neither loses bulk nor is pulverised by fire. There is freestone in Nairn parish, and a few men are employed in the quarries. Peat is dug.

The soil is diversified. In the eastern part of the level tract along the coast it is generally a rich loam on a sandy or gravelly bottom: in the western part it is either a stiff rich clay or a sharp gravelly mould. In the mountainous districts it is chiefly a sandy loam, full of gravel and small stones

The climate in this part is cold and stormy, and the crops are later than along the coast, where the temperature is more favourable. Yet the crops are rarely if ever cut off by frost, nor are they materially retarded by the autumnal rains.

The agriculture of Nairnshire is in a very backward state. About twenty or thirty years since the farms were small and the tenantry poor. Most of them held their farms without leases. These poorer tenants followed the routine of agricultural practice, which had been long established; but the richer tenants and the proprietors were more willing to break through the shackles of custom and to introduce improvements. The proportion of arable land was small, especially in the Highland district, and almost the whole county was unenclosed. Manure, formed of dung mixed with turf or sand, was accumulated by means of sheep, which on the small farms (on nearly all of which a small flock was kept) were housed every night; and also by means of some black cattle and horses. This manure was spread over a portion, perhaps a fourth, of the farm, which portion, after three ploughings, was sown with bear or big, and this crop was succeeded by two or three successive crops of oats. A small plot was allowed for potatoes, and occasionally a patch for growing flax for domestic use. When, as frequently happened, the land became too much overrun with weeds to afford an adequate return, it was left waste for one or two years, and the horses and cows were turned in to feed upon it; after which it was again brought into cultivation, as above described. The tenantry were allowed pasturage for their cattle, either in the open down along shore or in the unenclosed moors near the foot of the mountains. The more opulent farmers had introduced fallows into their practice, and cultivated the artificial grasses and other green crops. The poor farmers made their own carts and agricultural implements, which were consequently of very inferior construction.

There are in the county about 8000 acres of natural wood and 4000 acres of plantations. The woodlands are chiefly on the banks of the rivers and their tributary streams.

The population of the county in 1831 was thus classified: 2074 inhabited houses; 2246 families; of which 742 families were chiefly employed in agriculture; 487 families in trade, manufactures, and handicrafts; and 1017 families in other occupations: the population consisted of 4307 males and 5047 females; total, 9354.

There are no manufactures carried on in the county except that of woollen cloth, which in 1831 employed about 50 men, who converted yarn into cloth for family use. The coast fishery gave employment to 127 men in the parish of Nairn; and 532 men were engaged in retail trade or in handicrafts, chiefly carpenters, masons, shoemakers, tailors, and smiths.

The county has no other subdivisions than parishes, of which it contains three entire, and portions of seven others, the remaining parts of which are in Inverness, Elgin, Ross, or Cromartyshire, and most of them in the first.

There is only one town in the shire, the royal burgh of Nairn, situated on the west side of the river Nairn, near its mouth. It appears to have been founded by William the Lion (who reigned from 1165 to 1214), and was originally called Invernaren. The town was afterwards granted by Robert Bruce (who reigned from 1306 to 1329) to the earl of Ross, Lord of the Isles, under whose descendants it probably continued till A.D. 1475. The site of the more antient town was at some distance from that of the present town: this change has resulted from the gradual advance of the sea upon the land, and the shifting of the bed of the river. The ruins of the antient castle which defended the town have been long covered by the sea; but thirty years ago some of the older inhabitants remembered to have seen them at spring-tides. The present town consists of one principal street parallel to the river, and of a number of smaller streets or lanes branching from it at right angles. Some new streets of greater regularity have been laid out on the north side of the town, near the shore; but little progress, if any, has been made in building them. The kirk lies back from the main street near the river; the town-hall, a part of which is used as the burgh and county prison, is in the main street; it was rebuilt about twenty years since. There are two dissenting places of worship. There is a bridge over the Nairn.

Considerable expense was incurred, some time since, in forming a harbour; but the great floods of 1829 almost ruined it, so that it is now only accessible to vessels of very small tonnage. The trade of the town, which never extended beyond the supply of a small district round, has been much injured by the ruin of the harbour. Nairn is a place of some resort as a bathing-place, and several villas have been erected in the neighbourhood. Some coal and lime are imported, and a number of boats are engaged in the herring fishery. The burgh and parish, which comprehends an extensive rural district, contained, by the census of 1821, 679 inhabited houses and 3228 inhabitants; by that of 1831, 721 inhabited houses and 3266 inhabitants: 38 of the houses were assessed at 10*l.* a year value or upwards, and more than 60 were estimated to be worth 10*l.* a year or more. There is a weekly market: and six stated fairs are held in the year.

The burgh of Nairn belongs to the Inverness district of burghs, which comprehends Inverness, Fortrose, Forres, and Nairn, and returns one member. The number of councillors, as determined by act 3 & 4 Will. IV., c. 76, is 9; the number of registered voters is above 60. The yearly revenue of the corporation is upwards of 140*l.*; the expenditure about 10*l.* more. The whole of the trades make but one corporation. The jurisdiction of the burgh magistrates has dwindled to the cognizance of petty thefts and assaults.

Several Roman coins have been discovered at Nairn. (Carlisle, *Top. Dict. of Scotland.*)

Auldearn, a parish, the kirk of which is about two miles south-east of Nairn, is a burgh of barony. The parish had, in 1831, 330 inhabited houses and 1613 inhabitants.

Nairnshire is united under one sheriff with Elginshire: the sheriff, as in the other counties of Scotland, is a paid legal functionary or judge, with extensive jurisdiction in civil cases and more restricted jurisdiction in criminal cases. (MacCulloch's *Statistical Account of the British Empire.*)

There is little crime in the county, and that little is decreasing, from greater decision in enforcing the laws against smuggling, and from the growth of self-respect, the result of the increased civilization of the people. Petty assaults and other breaches of the peace, almost all arising from drunkenness, are the most common offences. Drunkenness is however diminishing; but the condition of the people is much depressed. Most of the adults are able to read, and the men can generally write. (*Second Report of Inspectors of Prisons.*)

There is much suffering among the people from poverty: in the parish of Nairn alone, in 1836, 200 persons were on the poor-roll. The condition of the able-bodied labourer has however improved. There is a savings' bank near Nairn. Potatoes and herrings form a considerable portion of the food of the poorer classes.

The three parishes which are wholly within the county, and two of those which are partly within it, are in the presbytery of Nairn; the remainder of those which are partly in the county are severally in the presbyteries of Inverness, Forres, and Dingwall. The presbytery of Dingwall is in the synod of Ross; the other presbyteries are in the synod of Moray.

For parliamentary purposes the county is united with that of Elgin: the two return one member. Before the Reform Act, Nairnshire returned a member alternately with Cromartyshire.

This county was formerly included in the district of Moray. It contains some antiquities, of which the most interesting is Calder or Cawdor Castle, the antient seat of the thanes of Cawdor. In this building tradition has fixed the scene of the murder of Duncan by Macbeth, and the very bed in which he was murdered is professedly shown; but the tower, which alone remains of the old castle, and to which is attached a more modern building, is obviously of later date than the transaction connected with it. In the parish of Nairn are the vestiges of an antient fortress, called *Caistle Fionlah*, i.e. Finlay's Castle; and at no great distance are the remains of the castle of Rait, the seat of the Cummins. Below this castle there is a place called *Knock-na-Gillan* or *Knoch-na-Gillaw*, i.e. 'the hill where the young men were killed.' It takes its name from the slaughter, by the Cummins, of eighteen of the clan MacIntosh with whom they had a feud.

In the year 1645 the low country, the people of which favoured the Covenanters, was ravaged by Montrose, who destroyed the fishermen's boats and nets. The Covenanters, under General Hurry or Urry, attacked him at Auldearn

near Nairn, but were beaten with the loss of 2000 men. Montrose burnt the towns of Elgin and Nairn.

In the Rebellion of 1745-46 the royal army in pursuit of the Pretender's forces crossed the county. The battle of Culloden was fought just beyond the boundary, in the county of Inverness.

(Playfair's *Description of Scotland; Beauties of Scotland;* MacCulloch's *Statistical Account of the British Empire; Municipal and Boundary Commissioners' Reports* and other Parliamentary Papers; Carlisle's *Top. Dict. of Scotland.*)

NAKED SEEDS. This name was applied by Linnæus to a small form of fruit which does not directly bear a style at the apex, and which has the appearance of a seed, as in the Sage, the Dead-nettle, the Borage, &c.: such fruits are now called *spermidia* by many writers. Naked seeds strictly so named are seeds which are fertilised by immediate contact with pollen, and which have no pericarpial covering: they are at present known only in the great class of Gymnosperms, that is to say, in Coniferæ, Cycadaceæ, and Loranthaceæ. It however sometimes happens that seeds burst through their pericarp, after the influence of the pollen has been communicated to them, and long before their maturation, as in Leontice thalictroides. In such cases they are, strictly speaking, naked, but not in the sense in which the term is usually applied.

NAKHICHEVAN. [Georgia.]

NAKHIMOV, AKIM NIKOLAEVITCH, a Russian poet, was born at Kharkov, of wealthy parents, in 1782, and educated at the university of Moscow. According to the usual custom of that period, he entered the military service at an early age, but did not long continue in it; for, on the new university being opened at Kharkov, he enrolled himself among the students, and applied himself to literature with such zeal and diligence as to excite general astonishment. Having taken his degree, he retired to his own estate to indulge in that fulness of literary enjoyment which his fortune permitted him, and in that domestic society which he shortly after secured to himself by his union with a very amiable young lady. Thus eminently favoured in every respect, the tranquil felicity of his life met with no other interruption than that of a premature death, for he was suddenly carried off by a fever, July 17-29, 1814, in the 32nd year of his age, leaving behind him two infant children, to whom he had looked as pledges of the increasing happiness in store for him.

Though of amiable disposition and possessed of a fund of good sense and philosophy, Nakhimov had many singularities, and was at times morbidly shy even among his most intimate acquaintance. Another trait in his character was his singular diffidence of his own literary talents, notwithstanding that his favourite subjects, and those in which he best succeeded, were of a satirical cast. This turn for caustic observation displays itself also in his 'Fables,' which are remarkable for their epigrammatic point. Besides his satires in verse, he wrote many pieces in prose that partake more or less of the same spirit, more particularly that entitled 'The Speaking Monkeys,' which was composed in derision of the attempted conquest of Russia by Napoleon, and which may challenge comparison with Voltaire's 'Micromogas.' A short memoir of him, with a critical notice of his chief productions, was published at St. Petersburg in 1818, by Dr. Maslovitch.

NAME. [Noun.]

NAMEN. [Namur.]

NAMES, PROPER, are words by which single objects are denoted, as countries, rivers, towns, men, &c.

But when we speak of proper names, we mean, more usually, the names of men; and on this subject, to which little attention has hitherto been paid, and especially such proper names as appear among ourselves, it is our intention to offer a few observations.

In the primitive state of society, as soon as men were so far advanced as to find the convenience of having a verbal denotation of the individuals who composed a tribe, the rule would undoubtedly be, 'one man, one word:' we see this to be the case in the uncivilized tribes; and as man is presented to us in very early historic periods, we still see the same system prevailing. In the Hebrew genealogies, which ascend much higher than any which possess the slightest claim to our respect in any other nation, we find a single word, as *Terah, Abraham, Reuben, Aaron, David, Solomon,* the only designation of the persons whom those words call up before us; and if in any instance there is any deviation from the rule, it is for some special reason, and we see it to be an exception to what was the usual practice.

In the other nations, the fathers of European civilization, it was the same, Egypt, Syria, Persia, and Greece; one person, one word: and so in the earliest periods to which we can ascend in the history of the Latin nation, we have rarely more than one word to denote one individual, or if there is a second word employed, it bespeaks an origin in something which is apart from the simple, colloquial, and usual designation of him.

In the Celtic and German nations it appears to have been the same; *Arminius, Ariovistus,* and the like: and in Britain, *Caractacus.* The Saxons were a nation in whom this, the primitive system, was still prevalent, not only when they first established a colony in Britain, but during the whole period when the descendants of Hengist held the supreme authority in this island. Persons do, to be sure, present themselves in the pages of historians with such additions as *Harefoot, Ironside,* but it may be reasonably doubted whether these terms can be properly regarded as *names,* and if it is admitted that they may be such, still these are only exceptions, the great mass of the Saxon population, of whatever rank, having but one single word by which the individual was denoted, such as *Edwin, Alfred, Gurth, Ulf, Tosti, Harold,* and the like.

As nations advanced in refinement, the names of the individuals comprising them became more complex. Amongst the Romans, for instance, we have *Publius Cornelius Scipio Africanus, Caius Julius Cæsar, Publius Ovidius Naso;* and names of this class formed the rule, at least in families which were free. The slaves probably remained with the single word only.

We have not room to enter into an examination of the principle on which this new form of personal denomination was constructed. A uniform principle, like that very valuable one on which our own personal nomenclature is at present constructed, perhaps did not exist, so that our present system is rather to be regarded as the invention of modern nations, than as borrowed by them from any of the nations of more antient civilization.

The principle of the modern system of personal nomenclature in our own nation is this: to have one name for the individual, joined to a second name, which is common to some particular stirps in the great English family to which he belongs. We call the two the *name* and the *surname.* We think in these days much more of the latter than of the former. But in the more solemn acts of our lives, we find the proper consequence given to that which is indeed the name; in baptism, in elementary Christian instruction, at marriage, when the name is the thing in question, it is that which is properly the name, and not the surname, which is pronounced; *John, Richard, Anne.* We may find in books, even down to the close of the seventeenth century, that catalogues and indexes are sometimes so constructed, that the names, and not the surnames, are ranged in alphabetical order. Philips's 'Theatrum Poetarum' presents a late instance.

The value of this principle lies here: that it is a simple and easy mode of showing, to some extent, to what family an individual belongs; it promotes family union; but its chief advantage lies in the facilities which it affords for conducting inquiries into the condition of the ancestors of persons who may feel any curiosity on the subject, which, without the indications afforded by identity of surname, could be attended with very little success, when it was attempted to ascend beyond the recollections of persons still living.

This mode of designation, we believe, prevails in most other countries of modern Europe. In England it is almost the universal plan. The royal house of England forms an exception, an unchangeable surname having never been adopted by them. In this respect the house of Brunswick is like the houses of Saxe, Nassau, Bourbon, Orleans, and a few others, springing from the persons who were of prime note in that state of society when the rule was, 'one person, one word,' and being afterwards too conspicuous by rank and station to need any such ordinary mode of distinction as that which the adoption of an invariable addition to the name would have given them. This was once not peculiar to the roya. house of England in this island (the Stuarts, it may be observed, and perhaps the Tudors, but not the Plantagenets, were a temporary exception, being families of inferior rank, who were raised by circumstances to the possession of the

regal dignity), for the earls, in the first two or three centuries, seem also to have disdained a practice which assimilated them too nearly to the classes next below them. Thus the persons distinguished in Domesday Book as *Comites*, are *Comes Hugo*, *Comes Rogerus;* and never, we believe, with names of addition which descended to their posterity. But all these great houses have become long ago extinct.

There is also an exception to the modern rule, of another kind. There are still some remote and rudely-cultivated districts, in which the inhabitants are better known by some *by name*, as of the house in which they live, or as the son of some person well-known, than by any unvarying addition to their name properly so called. This is said still (or at least very lately) to be the case in some parts of Yorkshire and Lancashire, and is certainly the case in parts of Wales, but it is probable that the extension of education will bring all parts of this island into subjugation to a plan which has such obvious convenience.

If it is inquired when the system on which we now proceed was first adopted, the fact which has just been stated, that even now the system is not universally prevalent, will show, what is indeed the fact, that, like many other things, it has made its way by degrees. There is not, we believe, a single instance before the Conquest of persons in genealogical succession bearing the same surname; and it is also quite certain that in the mass of the population of England after the Conquest, the descendants of the Saxon population, there can rarely, if ever, be shown an instance of successive individuals of the same family being distinguished by the same surname in the two centuries immediately succeeding the Conquest. We have indeed but imperfect means of pursuing the inquiry for those two centuries. The names of the people of those centuries lie buried in unprinted records and chartularies. But if there are exceptions, and Saxon families in these centuries to be traced using an invariable as well as a variable name, it is in that remarkable class, who still exist in no very small number, who have one of the old Saxon appellatives in the place of the surname, such as *Thorold*, *Swaine*, *Aldred*, *Thoroughgood* (Turgot), *Godwin*, and the like.

But we find in Domesday Book that several of the Normans and other people from the Continent, who became settled in England at the Conquest, and soon after that event, are distinguished by names of addition, which are not merely personal, but names which were borne by themselves and their posterity after them. Such are *Darcy*, *Arundel*, *Devereux*, *Balliol*, *Burun*, *Laci*, *Perci*, and others, people just below the rank of the comites, and who, gaining great possessions and great power, were afterwards very conspicuous in English history. These are the persons, we conceive, who first set the example of the practice which has since become all but universal among us.

The disposition which always more or less exists to imitate what is done by a superior, is probably the principle to which we are to refer the change in this point which we find to have taken place by the middle of the fourteenth century.

By that time the present system may be said to have been pretty generally established in all the well-settled portions of the island. The statute of additions of the 1st Henry V., by requiring that the name and description of the party should be exactly set forth in any writ or indenture, would do something to consolidate the system: and when it was required that in all parishes a register should be kept of baptisms, marriages, and burials, which was one of the acts of the Reformers, there was a new check presented to any attempts at relaxation in the practice.

But even at the beginning of the fifteenth century there was much that was unsettled in the personal nomenclature of England even in families to whom pertained portions of the soil. Thus in 1406 a person describes himself as *Willielmus filius Adæ Emmotson*, who in 1416 is *Willielmus Emmotson;* and more remarkably, about the same time, a person who is described as *Johannes filius Willielmi filii Johannis de Hunshelf* appears soon after as *Johannes Wilson*. About the same time we had *Willielmus Johnson Wilkinson*, *Willielmus Adamson Magotson*, and *Thomas Henson Magot*, showing the present system then in its rudiments.

As the system at present existing made its way by degrees, and with much of casualty, so there seems to have been much also of accident in respect of the name of addition which marked the distinction of the stirpes. There are some of the surnames in common use among us for the adoption of which it is difficult now to assign any satisfactory reason. This is partly to be attributed to the corruption which many names have undergone, and partly to the strange additions which we find in the place of surnames in early documents of undoubted authenticity. One of these is *Adam that God made*, whose addition, if he lived at the period when his race first began to conform themselves to the system, would appear now in some form which would probably foil the sagacity of the most skilful inquirer. Sometimes there is a difficulty arising out of a wrong apprehension of the origin. Thus we have the names *Spring*, *Summer*, *Winter;* there is no *Autumn*. It is difficult to conceive how the names of the seasons should become the names of families; but in fact it is not so, *Spring* being a word denoting a small grove of trees, so that the name classes with *Wood*, *Holt*, and others concerning which there is no difficulty; while *Summer* and *Winter* are *Summoner* and *Vintner*, names derived from occupations.

But the great mass of our surnames may be easily explained. We cannot enter here at large into the subject; but it may be useful to those who are inclined to prosecute it, to say that nearly the whole of them may be referred to one of the five following classes:—

1. Foreign names brought in by settlers from other countries, including the Scotch and Irish names. These designate a very large section of the whole population; and there is a constant accession being made to them by the tide of population setting towards England. Very few of the names of this class introduced in the early periods remain: the great majority being of families who have become settled in England in the course of the last century and a half.

2. Names of locality.—These are divisible into two great portions: those which are derived from places of generic names only, such as *Hill*, *Dale*, *Cliff*, *Slack*, *Combe*, *Grove*, *Shaw*, *Frith*, and many others, mostly monosyllabic, which would originally appear as *John de la Hill*, &c.; and those which are derived from some specific place, as *Atherton*, *Burton*, *Denby*, and thousands of others, there being scarcely a town, village, or hamlet which has not given its name to some English family.

3. Names of occupation.—Of this class the number is very great. We have *Brewer*, *Barber*, *Smith*, *Mason*, in short every trade and every other occupation in which men engage. Lost trades or trades which have changed their names are preserved in the names of families whose ancestor was engaged in them at the time when his family fell into the system. Thus we have *Fletcher*, *Girdler*, *Furbisher*, *Stringfellow*, *Lister*, *Walker*, *Pargiter*, *Webster*, *Taverner*, and the like. We have also *Palliser*, *Lander*, *Foster*, *Palfreyman*, *Page*, *Woodruffe*, *Reeve*, *Hunter*, which were evidently at the beginning names of occupation. It is difficult to account for such names as *Bishop*, *Baron*, *Earl*, *Lord*, *Priest*, *King*.

4. A large portion of our personal nomenclature is made up of surnames which are formed upon those which we call Christian names. Nearly all these appeared originally in the form of *Filius*, &c., as John son of William. This mode of designation has taken various forms. Thus on this name of *William*, there are founded *Williams*, *Williamson*, *Wills*, *Wilson*, *Wilks*, *Wilkins*, *Wilkinson*, *Willis*, *Willison*, *Bill*, *Bilson*, *Willet*, *Willimot*, *Willmot*, *Till*, *Tilly*, *Tillot*, *Tilson*, *Tillotson*, *Willy*, each of which, if written by a scribe of the middle ages in Latin, would be expressed by the same phrase, *Filius Willielmi*. Other names have an equally numerous progeny. To this class may be referred *Ives* and *Iveson* which are *Filius Judei; Clarkson*, *Cookson*, *Wrightson*, which are names formed not indeed on the name, but the profession of the parents.

It would however be to extend this article to an inordinate length, even to touch upon the subordinate classes to the five great classes.

5. The fifth and last is that of names which indicate something peculiar in the personal appearance or mental qualities of the person to whom they are first given. Such are *Swift*, *Long*, *White*, *Black*, *Crump*, *Rouse*, *Wise*, *Good*, &c.

Of the proportions in which names of the five classes enter into the composition of English society, some idea may be formed by the following analysis of 896 names, found in what was called the 'Fashionable' class of the inhabitants of Bath. Throwing out 162 as of uncertain origin, there remained 734 surnames, which give the following results:—

1. Foreign names, 142.
2. Names of locality. Generic, 57; specific, 249. Total, 306.
3. Names of occupation, 79.
4. Patronymical, 172, of which 43 were Saxon names.
5. Descriptive, 35.

The results would be somewhat different in a population of a different kind. There are six families who have names of occupation in the English peerage. The number of the individuals bearing the names varies greatly in the five classes. The ratio of the number of persons bearing the name to the name itself is the lowest in the first and second classes.

The nations who contributed the 142 foreign names were these:—

Scots,	44	German, 9	Italian,	2	Poles, 1
French,	39	Dutch, 6	Portuguese,	2	
Irish,	32	Welsh, 5	Cornish,	2	

Thus much for the *surname*.

The *names* of the antient Saxon population of England were nearly all descriptive of some quality of mind or body. Thus *Edward* is truth-keeper; *Winfred*, win-peace; *Alfred*, all-peace; *Edmund*, truth-mouth; *Ailwin*, of all beloved; *Ulf*, wolf. But a great change took place soon after the Conquest. We see in the names of the Normans who became settled in England many which continued for ages favourite names of the English nation; *Roger, Ralph, Hugh, Humphrey, Geffrey, Gilbert.* To them also we owe the introduction amongst us of names of religion. If these names existed at all in England before the Conquest, they were exceedingly rare. In the catalogues of Saxon bishops, not one occurs. Even amongst the first race of Normans they did not abound. We find *Adam, John, Stephen, David, Peter, Matthew*, and perhaps a few others. But in the century and a half after that event, names of this class began to prevail in a great degree. It was a period of extraordinary Christian devotion: the exertions in founding monasteries, building churches, and maintaining the war against the infidels show it. In this state of the public mind the new system of taking names of religion spread and strengthened. The names of religion were almost wholly from the Old and New Testament, a few only being taken from the names of persons who have been eminent in later times for their Christian virtues.

Since then little change has taken place. A few names once common have lost their popularity; a few others have been introduced. There have been periods when names somewhat fantastic have had a popularity; such as the names of the virtues, as *Patience, Truth, Prudence, Faith*, by which women have been named; *Thankful, Faithful, Sabbath*, and others more extraordinary, have been given to men. Some went for a time into another extreme, and we had *Hannibal, Scipio, Cæsar*, and *Hercules*.

We have however not been sufficiently attentive to the importance of keeping up a stock of what we call Christian names. Our population has increased to a very great extent, while our surnames have rather diminished than the contrary. We should therefore, if we wish that names should be what they are intended to be, *Notamina*, increase the number of those names out of which we have the power ourselves of selection. As it is, with a population of 20 or 30 millions, we have but 53 names of men which can be used without some appearance of singularity. Of these 12 are in more frequent use than the rest:—

John	William	Henry	George	James	Robert
Thomas	Francis	Charles	Edward	Richard	Samuel

Of these, 4 are names of religion; 4 are names introduced at the Conquest; 3 names introduced at a later period from the nomenclature of other countries; 1 is pure Saxon. Of the 41 names of secondary frequency, 28 are names of religion; so that of the 53 names of men in ordinary use, 32 are names of religion, or considerably more than one-half, and they are all taken from the Scriptures.

Again, looking at the 53 names in respect of the languages from which they are derived, it appears that

25 are of Hebrew origin,
19 from the various dialects of Western Europe,
5 from the Greek, and
4 from the Latin.

There are a multitude of names, once in use in England, which might easily be revived, and it would be a matter of some public convenience to do so. Few persons have not found inconvenience in some form or other from the want of sufficient distinctness in the name he bears. Thus a little time ago there were two antiquarian Chalmers'; two Parkes upon the bench; two Whitakers, both clergymen, and both writers on Lancashire topography: some time ago there were two Dr. John Thomas's, both chaplains to the king, and both bishops; and two Dr. Grays, both divines, both writers in their own profession, both connected with historic literature and poetry, and both engaged in controversies with Warburton. This occasions confusion. To change a surname is a difficult and expensive process; the cheapest and simplest remedy is to give a name at baptism which will be marked and remembered, as *Basil Hall*. Of neglected names there are, *Austin, Allan, Aubrey, Arnold, Baldwin, Blase, Barnard, Fabian, Ferdinand, Josceline, Miles, Sylvester, Theobald, Theodore*, and a host of others. But it might be worth the consideration of government, whether some facilities should not be afforded for increasing our very scanty stock of surnames by the revival of many which are now extinct and lost in persons who descend from those who bore them.

NAMUR, the French name for NAMEN, a province of the kingdom of Belgium, bounded on the north by Brabant, on the north-east and east by Liège, on the south-east by Luxemburg, on the south by France (department of Ardennes), and on the east by Hainault. Its greatest length from north to south is 55 English miles, and its greatest breadth 42 miles; its area is 366,181 hectares, equal to 904,467 English acres, or 1413 square miles, and is thus employed

In cultivation . .	181,306	hectares.
Marshes and waste land	48,343	"
Woods and forests .	125,541	"
Sites of buildings .	1,277	"
Roads and streets .	7,523	"
Rivers and streams .	1,658	"
Undescribed . . .	533	"
	366,181	hectares.

The province is watered by the Maas, the Sambre, the Lesse, and several small streams, by which it is traversed in all directions. The Maas enters Namur from France, near the town of Givet, and runs north-north-east about 9 miles to Dinant, when it flows to the north-north-west for 17 miles to the city of Namur, and turning to the east-north-east, enters the province of Liège at the distance of six miles from Namur. The Sambre enters the province from Hainault about 10 miles east of Namur, at which city it falls into the Maas. The Lesse enters Namur from Luxemburg at Palizeul, and flowing first to the north, and then to the north-east, falls into the Maas a short distance south of Dinant.

The soil of the province is generally fertile, consisting for the most part of an unctuous marl, but without any great depth. Of the three *arrondissemens* or districts into which the province is divided, viz. Namur, Dinant, and Philippeville, that of Namur is the most productive, the other two being more stoney. The principal agricultural products are wheat, rye, oats, barley, hemp, flax, and chicory. The grain harvests do not more than suffice for the consumption of the province. There are few natural meadows in the district of Namur, but in the other parts of the province the meadows are the most profitable of the lands. Artificial grasses are also much cultivated, especially trefoil in the district of Namur. Wood grows abundantly in the province. The trees are principally oak (the bark of which forms an article of export), beech, ash, hornbeam, birch, and hazel. With the exception of the oak trees, which are used for building purposes, the wood which is cut is converted into charcoal for the use of smelting furnaces. A great many plantations have been made of late years, especially in places where, through a want of depth in the soil, its cultivation cannot be profitably conducted. The breeding of draught horses forms an important branch of rural occupation; they are at once strong and active, and the farmers are careful to preserve the breed unmixed. Great numbers of swine are bred, and are mostly sold to itinerant dealers. Near to Dinant some are killed and salted for exportation. The farmers occasionally suffer from the visits of wolves, and there are great numbers of foxes, rats, weazles, and polecats.

The mineral productions of the province are iron, lead, coal, marble, and potters' clay. The quantity of iron made in the course of a year is stated to be 30,250 tons, nearly the whole of which is smelted with wood charcoal, requiring annually the produce of 6000 to 7000 hectares (16,000 acres). The number of people employed in the iron-works is 913, in addition to miners, wood-cutters, charcoal-burners, waggoners, &c., amounting to 13,700 persons. The lead-mines which are near the city of Namur have been open since 1619, but their working has been discontinued at various times. These mines are worked by a company, who employ in them about 200 men. No return of the produce has been given. The coal-field of this province has already been sufficiently described. [BELGIUM.] The marble quarried in Namur is found in various parts of the province, and gives employment in sawing and polishing it to a great number of persons. It is of various colours, red, grey, blue, and black; the greatest part of what is raised is exported to France. The potters' clay found in the province is used chiefly at Namur and Ardenne.

In addition to the branches of industry already mentioned, Namur contains the only copper-works in Belgium. The raw material is procured chiefly from Sweden, and the principal market for the manufactured goods is found in France.

The province of Namur contains only five towns, Namur, Ardenne, Dinant, Fosse, and Philippeville. With the exception of the capital, they are all inconsiderable places. Ardenne is situated on the right bank of the Maas, near to the border of Liège, in 50° 30′ N. lat. and 5° 4′ E. long. Its population in 1837 was 4314. Various kinds of earthenware are made in the town, and there is a paper-mill in which 140 workmen are employed. Dinant is likewise situated on the Maas, in 50° 17′ N. lat. and 4° 54′ E. long. Its population in 1837 was 5033. They are engaged in manufacturing woollen cloths, paper, and hats, and in cutting and polishing marble. Fosse, a small town with 2722 inhabitants, is situated in 50° 22′ N. lat. and 4° 42′ E. long., about 9 miles south-west of Namur. The coal-mines and marble-quarries in the vicinity give employment to many of the inhabitants. Philippeville, in 50° 12′ N. lat. and 4° 32′ E. long., although the capital of an arrondissement, has only 1127 inhabitants. It is built on an eminence and fortified: the walls form an irregular pentagon. The town is composed of ten wide well-paved streets.

The population of the province, on January 1, 1838, was 229,665. The movement of the population during 1837 was as follows:—

	Males.	Females.	Total.
Born—in towns	567	622	1189
„ in the country	3211	3046	6257
	3778	3688	7466
Died—in towns	514	491	1005
„ in the country	2002	1902	3904
	2516	2393	4909
Marriages			1673

The number of houses in the province was then 43,096, and of separate families 46,995. With the exception of about 400, the whole population profess the Roman Catholic religion.

NAMUR (in Flemish, *Namen*), the capital of the province of that name, is situated in 50° 28′ N. lat. and 4° 48′ E. long., at the confluence of the Sambre and the Maas. It is considered to be the strongest fortress in Belgium. It is entered by eleven gates; the streets are wide and clean; the houses are mostly built of a bluish stone and are slated. There are several squares; two bridges, one over the Maas, the other over the Sambre; and six churches, one of which is the cathedral dedicated to St. Aubin. This is a fine building of modern architecture; the front is ornamented with twenty Corinthian columns, sustaining a cornice which bears several statues of white marble. On either side of the great altar are fine statues in Carrara marble, representing St. Peter and St. Paul. This building was begun in 1750, and finished in 1767.

The situation of Namur, at the confluence of two navigable rivers, is favourable to commerce. The two chief branches of industry are the manufacture of cutlery and tanning. Great numbers of workmen are employed in the neighbouring collieries, marble-quarries, and mines of iron and lead. There are four cattle-fairs held in the year, in February, May, July, and November. The great fair begins the 2nd of July, and lasts fifteen days.

The castle of Namur is said to have been built at the end of the sixth century, and for more than four centuries thereafter the city was of very insignificant dimensions. Early in the eleventh century, under the reigns of Albert I. and II., it was much enlarged, and by the beginning of the fifteenth century Namur had attained its present dimensions.

This fortress has sustained several sieges, the most celebrated of which was successfully undertaken by Louis XIV., assisted by the renowned Vauban, in 1692. The French maintained themselves for three years in the fortress, to the defences of which they made several additions. On the 3rd July, 1695, the town was invested by the English under William III. The garrison, under the Marshal de Boufflers, consisted of 14,000 men, but the attack was so fierce, that the marshal capitulated on the 4th of August. Namur was unsuccessfully attacked by the count of Nassau in 1704; it was ceded to Austria, in 1713, and put under the care of Holland in 1715. In 1746 it was taken by France, but was restored to Austria, under the treaty of Aix-la-Chapelle, in 1748. The fortifications were demolished by Joseph II. in 1784, but were afterwards restored. It was taken by the French in 1792, retaken by the Austrians in the following year, and falling again into the hands of France in 1794, was constituted the capital of the department of the Sambre and Meuse, and so continued until 1814, when the Netherlands threw off the yoke of France. Namur was the scene of an obstinate battle in 1815, between the French and Prussians.

The population of the city, on January 1, 1838, was 20,480.

NANCY, or NANCI, an important town of France, capital of the department of Meurthe, situated on the left bank of the Meurthe, 172 miles east of Paris in a direct line, or 206 miles by the road through Epernay, Châlons-sur-Marne, and Bar-le-Duc; in 48° 41′ N. lat. and 6° 12′ E. long.

Nancy is not known to have existed before the twelfth century. In the middle ages it was the capital of Lorraine, and was several times taken and retaken, especially in the struggle in which René II., duke of Lorraine, had to engage with Charles le Temeraire, duke of Bourgogne [BOURGOGNE], for the possession of his duchy. It was under the walls of this town (Jan., 1477) that Charles experienced his last fatal defeat, in which he fell. In the reign of Louis XIII. (A.D. 1633) it was taken by that prince from Charles III. or IV., the then reigning duke of Lorraine. The fortifications were demolished on the restoration of the town to the dukes of Lorraine.

The town is situated in a fertile and pleasant plain at the foot of wooded and vine-covered hills. It consists of two parts, the old town on the north and the new town on the south. The old town retains some portions of the old fortifications: the streets are narrow and crooked. The new town, commenced in the beginning of the seventeenth century, has wide and straight streets, lined with good houses: the stateliness of its public buildings, and the extent and beauty of its squares and public walks, render Nancy one of the handsomest, though it is one of the dullest, of the great towns of France. La Place Royale is the finest of the squares: one side is formed by the town-hall (one of the handsomest in France), containing a gallery of pictures; two other sides are occupied by the office of the prefect, the custom-house, the theatre, and some private houses. In the angles of the square are four fountains, and in front of the town-hall a triumphal arch, erected by Stanislas Leckzinsky, duke of Lorraine, to Louis XV. Two streets run in a direct line from this square to two of the town-gates, built like triumphal arches. The cathedral is not remarkable, except for a portal with a triple row of columns, and for the high altar. The little church of Bon Secours, in the suburb of St. Pierre, is adorned by the monuments of Stanislas Leckzinsky and his wife. This church was erected by Stanislas to replace one built by René II., on the spot where Charles of Bourgogne fell. There are fine barracks both for cavalry and infantry, an Exchange, and other public buildings. In the old town is the antient Gothic castle, the former residence of the dukes of Lorraine; and adjacent to it is a small church of Gothic architecture, the burial-place of the ducal family. The tomb of René II. and some

others are in the church itself; others are in a round chapel attached to the choir. This chapel was restored in 1822, at the joint expense of the French and Austrian governments: it is lighted by some stained-glass windows in the cupola by which it is surmounted, and contains seven marble tombs erected to the memory of the dukes of Lorraine or members of their family, a marble altar on which is a sculpture of Christ in his grave-clothes, and other ornaments. The remains of several of the princes of Lorraine lie in the vault beneath.

The population of Nancy, in 1826, was 29,122 for the commune; in 1831 it was 29,001 for the town, and 29,783 for the whole commune; in 1836 it was 31,445 for the commune. The inhabitants manufacture hosiery, hats, and gloves; and embroider muslin. This latter branch of industry employs many hands; the embroidery is sent to Paris and to the colonies. They spin cotton yarn by the agency of steam; and make coarse woollen cloth, calico, muslin, and other cotton goods. Some chemical preparations are manufactured; also vermicelli, liqueurs, paper-hangings, and earthenware. There are several establishments in the town or neighbourhood for spinning woollen-yarn and weaving muslin and calico; besides tan-mills, tanyards, dye-houses, breweries, and oil-presses. There is near the town a large bed of stone well adapted for lithographic printing. Trade is carried on in the various manufactured articles; and in grain, wine, brandy, wool, and iron. There are two yearly fairs, one of twenty days.

Nancy is the seat of a bishop, whose diocese comprehends the department of Meurthe, and who is a suffragan of the archbishop of Besançon; of a Cour Royale, whose jurisdiction comprehends the departments of Meurthe, Meuse, and Vosges; of a subordinate justice court and a commercial tribunal; and of several fiscal or administrative government offices. There are several hospitals and charitable institutions, and a house of correction.

There is a public library of 23,000 volumes; and there are libraries attached to the bishopric, the Cour Royale, and the high school. There are a rich museum, a cabinet of natural history, and a botanic garden; an académie universitaire, a high school, and a seminary for the priesthood; a school of design, and a secondary school of medicine; a central agricultural society, a royal society of sciences and arts, an elementary Protestant school, a Bible society, and a society formed by the wealthier Jews of the department for the instruction of the poor children of their nation in the useful arts.

Nancy was the native town of Marshal Bassompierre, of Claude Lorraine the painter, of Calmet the Benedictine, and other eminent men.

The arrondissement of Nancy has an area of 551 square miles, and contains 187 communes; the population, in 1831, was 127,944; in 1836 it was 129,841.

NANGASAKI. [JAPAN.]

NANI'NA, Mr. Gray's name for a genus consisting of the phanorbicular species of *Helix*, with large umbilici, included in the subgenus *Helicella* of De Férussac. The animal was first discovered and figured by General Hardwicke in 1797. Mr. Gray characterizes the genus, and enumerates the species in the 'Zoological Proceedings for 1834.'

NANING is the name of a country which up to 1832 was possessed by a Malay chief, who was tributary to the British province of Malacca. In the year 1832 Naning was annexed to that province, the chief having risen in rebellion against the East Indian government. It lies at the back of the other territories, and separates them from the small kingdoms of Rumbowe and Johole. It extends north and south about 40 miles, with an average breadth of 10 miles, which gives an area of 400 square miles, or nearly the extent of the county of Bedford. The surface is undulating, interspersed with high knolls thickly clothed with jungle; the hollows or flats between the undulations, where the water lodges in the rainy season, average seventy or eighty yards in width, and either form a swamp or paddy ground. The soil on the high grounds is red and generally gravelly; on the flats it is soft and whitish. Water is plentiful, and may easily be got two or three feet below the surface, on the slopes of the rising grounds. The chief products are rice, timber, and fruits; pepper and gamboge are cultivated. Among the fruits are mangosteens, pine-apples, jack-trees, and many other kinds. There are forty-five species of trees in the jungle, of which the fruit is edible. A small portion of gold is found, and tin in considerable quantities. According to a census taken in 1829, the population amounted to 5458, probably males, as it is added that 1800 were capable of bearing arms. They are Malays, profess the Mohammedan faith, and live in villages, of which the largest, called Sabany, contains 148 houses. (Moor's *Notices of the Indian Archipelago*, Singapore, 1837.)

NANKEEN, a description of cotton cloths, usually of a yellow colour, imported from China, and taking their name from the city of Nankin, in which great quantities of them are made. The peculiar colour of these cloths is natural to the cotton-wool of which they are made, and not the effect of any dye. White cloths of similar texture are imported from China, and these, to distinguish them from the yellow cloths, are called white nankeens. Nankeen cloths were formerly very much used in England for gentlemen's summer clothing, but better fabrics of home manufacture being now procurable at lower prices, these have taken the place of the Chinese goods. Within the last ten years the annual importation of nankeen cloths into the United Kingdom, from China, has exceeded 990,000 pieces; but the quantity brought in 1838 was under 60,000 pieces, and the greater part of these was re-exported.

NANKIN, a town in China, on the south bank of the river Yantse-kiang, near 32° N. lat. and 117° E. long., and about 120 miles from the mouth of the river. It is said that at some remote period sea-vessels were able to ascend the river to the town, but the very low and swampy shore which extends in these parts along the Hoang-Hay (Yellow Sea) renders this statement improbable. This town was the capital of the empire to the end of the thirteenth century, and at that time the largest town on the globe. To give an idea of its then extent, the Chinese historical records say, that if two horsemen were to go out in the morning at the same gate, and were to gallop round by opposite ways, they would not meet before night. This is certainly an exaggeration. The Jesuits, when surveying the town for the purpose of making a plan of it, found that the circuit of the exterior walls was 37 *lies*, or nearly 20 miles; and this agrees pretty well with the description given by Ellis, who estimates the distance between the gate near the river and the Porcelain Tower at about six miles, and says that an area of not less than thirty miles was diversified with groves, houses, cultivation, and hills, and enclosed within the exterior wall, which forms an irregular polygon. But the whole of this area is not covered with houses built in regular streets; only about one-fourth of it at present is covered by the town, which occupies that part which is farthest from the river, and is about six miles from its banks.

The town began to decrease when Kublai-khan removed the Imperial residence to Pekin, and still more rapidly when the six great tribunals, which for some time were kept at Pekin and Nankin, were attached to the court at Pekin. When this took place the name of the town Nankin (the southern court) was changed into that of Kianning-foo, as it is now always called in public documents, though the people continue to call it Nankin.

The present town consists of four principal streets, running parallel to one another, and intersected at right angles by smaller ones. Through one of the larger streets a narrow channel flows, which is crossed at intervals by bridges of a single arch. The streets are not spacious, but have the appearance of unusual cleanliness. The part within the walls, which is now only occupied by gardens and bamboo-groves, is still crossed by paved roads, a fact which seems to indicate that the whole area was once built upon.

None of the buildings of Nankin are distinguished by their architecture, except some of the gates, and the famous Porcelain Tower, which is attached to one of the pagodas or temples. This building is octagonal, and of a considerable height in proportion to its base, the height being more than 200 feet, while each side of the base measures only 40 feet. It consists of nine stories, all of equal height, except the ground-floor, which is somewhat higher than the rest. Each story consists of one saloon, with painted ceilings; inside along the walls statues are placed. Nearly the whole of the interior is gilded. The material of the wall seems to be a highly polished stone; but probably it is composed of bricks made of a fine clay, susceptible of impressions, as the figures show which appear on them. On the outer side of the wall they are white, and, according to Ellis, are merely the white bricks frequently used in China. At the termination of

every story, a roof built in the Chinese fashion projects some feet on the outside, and under it is a passage round the tower. At the projecting corners of these roofs small bells are fastened, which sound with the slightest breeze. On the summit of the tower is an ornament in the form of the cone of a fir-tree: it is said to be of gold, but probably is only gilt; it rests immediately upon a pinnacle, with several rings round it. This tower is said to have been nineteen years in building, and to have cost 400,000 taels.

The population of Nankin, which is said to have been once four millions, is now probably reduced to 800,000. It still has a great number of manufactures, especially silk and crapes, and carries on a very considerable commerce, being situated in the most populous part of the empire. Through the ports of Soo-cheou-foo and Shang-hae it receives great quantities of corn and other articles. They are brought by water to Nankin, as there are several canals which connect the town with the river, which is five or six miles from it in a straight line. According to the statements of the Jesuits this city is also famous as the seat of arts and sciences, and furnishes more doctors and great mandarins than many more populous cities together. It has also the greatest number of libraries, and the numerous booksellers' shops are well stocked with the best publications. The paper made here is considered the best in the empire.

(Du Halde's *History of China*; Ellis's *Journal of the late Embassy to China*.)

NANNI, GIOVANNI, called Giovanni di Udine, was born at Udine, in 1490. He studied first in the school of Giorgione, and afterwards passed to that of Raphael, under whose direction he executed the greater part of the stuccoes and grotesque ornaments in the loggie and other apartments of the Vatican. He is considered as the most eminent in this branch of the art. His bowers, plants, and foliage, his aviaries, with birds of every description, are so true to nature as almost to deceive the eye by the closeness of the imitation. After the sack of Rome he visited other parts of Italy, and many of his works are at Florence, Genoa, and Udine. He died in 1464, at the age of 70. Vasari frequently calls him 'Ricamatori.'

NANO'DES. [PSITTACIDÆ.]

NANTES, a town in France, capital of the department of Loire Inférieure, situated on the north bank of the Loire, in 47° 13′ N. lat. and 1° 34′ W. long.; 208 miles from Paris in a direct line west-south-west, or 231 miles by the road through Versailles, Chartres, Le Mans, and Angers.

Nantes is a very antient town: it is mentioned by Ptolemy as the capital of the Namnetes, a Celtic people, under the name of Condevicnum, a name which was superseded about the time of the downfal of the Roman empire by that of Namnetes, whence the modern Nantes. In the ninth and tenth centuries it was six times pillaged and burnt by the Northmen, and continued desolate for thirty years. In A.D. 1598 Henri IV., who had come into Bretagne to appease the troubles excited by the duke of Mercœur [BRETAGNE], issued from this town an edict granting various privileges to his Protestant subjects. This edict, commonly known as the edict of Nantes, was revoked by Louis XIV. In the Vendean war, the town was attacked by a body of insurgents computed to amount to 80,000: the inhabitants, with some troops of the line in the town, succeeded in repelling them. Nantes was afterwards the scene of the cruelties of Carrier, the most ferocious of the agents employed at that time by the revolutionary government. Madame La Roche Jacquelin estimates the number of those who were drowned or shot or died in prison at 25,000.

The old town of Nantes was almost entirely comprehended in the angle formed by the north bank of the Loire and the east bank of its tributary the Erdre: a small part of the old town near the junction of the rivers extended across the Erdre to the opposite bank, on which the suburb of Le Marchys is situated. The suburbs of St. Clement and Richebourg are east of the town in the angle of the rivers, the latter extending along the bank of the Loire. The suburb of Les Ponts (the bridges) comprehends the islands of the Loire opposite the town, across which islands a chain of bridges and causeways communicates with the suburb of St. Jacques, on the south side of the river. The quay of La Fosse extends along the north bank of the Loire, west of the town: it is planted with trees for a considerable part of the length, and is lined with handsome houses with balconies, which may be considered as forming another suburb. The ramparts of Nantes have been almost entirely removed: the two promenades of St. André and St. Pierre, which form one line extending from the Erdre to the Loire, are on or near the site of one portion; and the boulevard, a public walk, west of the Erdre, is on or near the site of another portion. The antient castle of the dukes of Bretagne, a stately and massive building, is at the south-eastern point of the old town, on the Loire. By the destruction of the fortifications, Nantes and its suburbs have become one town: the space between the quay of La Fosse and the suburb Le Marchys has been filled with streets and squares, forming Le Quartier Neuf, or New Quarter; and various other improvements have been effected and are still going on.

The streets are generally well laid out and paved; and the houses well built, chiefly of stone, and roofed with slate. There are about twenty places or squares, which are regularly laid out: the Place Royale and the Place Graslin are adorned with handsome houses of uniform design. Part of the old town however yet retains the narrow, dark, and dirty streets, and the old black-looking houses, faced in some instances with a sombre covering of slates, which were formerly characteristic of the whole place. The street La Poissonnerie (Fish-street) is the most remarkable of these relics of the olden time: the upper parts of the houses project so as nearly to meet across the street.

The principal public buildings are the cathedral and the episcopal palace; the prefect's office (formerly the Chambre des Comptes), the Hôtel de Ville, the Bourse or Exchange, the theatre, the mint, the prison of Bouffay, the hospitals of Le Sanitat and the Hôtel Dieu, the Salorges (now used as a depôt for merchandise of all sorts), the corn-market, &c.

The cathedral is just within the line of the antient ramparts on the east side of the town: it has never been finished; the nave only was erected: the west front has three doorways, and is adorned with sculptures in high relief, which were much defaced during the Revolution; it is of the fifteenth century. It has two towers, which have never been finished; they rise little above the level of the roof: one of them is crowned with a lantern or turret built for the purpose of keeping watch on the movements of the Vendean insurgents. The interior of the nave is fine: it is not of great extent, but is very lofty: the transepts and choir were never built to correspond with the nave; but the heavy, low, and dark choir of a much more antient building of the sixth century was adjusted to the nave in the seventeenth century: the communication is by a modern portico. The cathedral contains the tomb of François II., last duke of Bretagne. The episcopal palace, which adjoins the cathedral, has the appearance of a common parsonage-house. The prefect's office has two good fronts, the principal towards the cathedral, the other towards the river; each front is adorned with an Ionic portico of four columns. The corn-market is a large, modern, and tolerably handsome building: above it is the public library of 30,000 volumes. The exchange is adorned with Ionic columns, with the statues of four of the most eminent seamen whom France has produced, viz., Duquesne, Jean Bart, Duquay-Trouin, and Cassard; and with a number of allegorical statues. The hospital of Le Sanitat is partly a receptacle for decayed townsmen, who here obtain lodging and board at a very low rate, and partly a lunatic asylum. There are no fountains in Nantes; but the town is adorned by several public walks; there is a departmental column 70 feet high, and in the Place Louis XVI. is a column surmounted by a statue of that king. There are a number of bridges, some of them over the fosse of the antient ramparts, now forming a ravine or deep valley in the town; others across the Erdre or the arms of the Loire. There are several low islands in this latter river opposite Nantes; that of Feydeau is nearest to the town, of which indeed it forms part; the others are the Ile Gloriette and the Ile de la Biesse, divided by the arms of the river into three parts. Communication is maintained between the opposite banks of the river by bridges from one island to another.

The population of Nantes, in 1826, was 71,739 for the commune; in 1831 it was 77,992 for the town, or 87,191 for the commune; in 1836 it was 75,895 for the commune. It derives its importance and prosperity from its situation on the Loire, which forms its port. The tide flows up to Nantes, but its rise in ordinary tides is only about 5 feet; and in winter it is imperceptible, being then counteracted

by the force of the stream. Vessels of 200 tons come up to Nantes at spring-tides; at other times only vessels of 100 tons or less can get up. Larger vessels either remain at Paimbœuf, 25 miles lower down, or at least discharge part of their cargo there. The quays at Nantes extend along the river side from the eastern extremity of the suburb Richebourg to the western or lower extremity of the quarter of La Fosse.

There are quays all round the Ile Feydeau and in one part of the Ile Gloriette, and along the bank of the Erdre, which expands into a fine sheet of water, resembling a lake, with its banks adorned with country-houses: it is navigable to Nort, 12 or 13 miles above Nantes. The merchants of Nantes enjoy a high reputation for the punctual fulfilment of their commercial engagements: they were formerly extensively engaged in the slave-trade; and during the last general war a hundred privateers were fitted out here. The manufactures are considerable, and include coarse woollen cloth and flannel, calico, handkerchiefs, fustian, bed-ticking, and other cotton or linen fabrics. There are copper-founderies, and iron-works for making chain-cables, casting cannon, and furnishing other articles for the equipment of vessels; ship-building yards (at which corvettes and other small ships of war are built) and ropewalks; breweries, brandy-distilleries, vinegar-yards, refining-houses for colonial and beet-root sugar, a glass-house for bottles, tan-yards, currying establishments, &c. Pottery, tobacco-pipes, chemical products, brushes, corks, and fishing-nets are also made. There is a victualling establishment for the navy, from which Brest, Lorient, and Rochefort are supplied. Provisions are very cheap. The trade of the port is not limited to any particular part of the world: the principal articles of export and import are grain, flour, ship-biscuit, butter, dried pulse, hides, morocco leather, timber, agricultural implements, Spanish and Portuguese wine, liqueurs, colonial produce, and French manufactures. Vessels are fitted out for the Newfoundland cod-fishery, and the fishery of the sardine, or pilchard, is actively carried on. The navigation of the river facilitates communication with the interior of France, and the dangerous navigation of one part of the coast is superseded by the canal from Nantes to Brest. The salt from the salt-pans of the coast about Noirmoûtier and Le Croisic is in great part conveyed into the interior by Nantes. There are two weekly markets and twelve yearly fairs.

Nantes is the seat of a bishopric, the foundation of which some carry back to the third century: the diocese comprehends the department of Loire Inférieure: the bishop is a suffragan of the archbishop of Tours. It is also the seat of a Lutheran consistory. There are nine churches, six nunneries, and four hospitals. There are a subordinate court of justice and a commercial tribunal, a custom-house, a mint, and a variety of other fiscal or administrative government offices. There are a high school, two seminaries for the priesthood, a school of design, a free school for navigation, a secondary medical school, and one or two courses of lectures. Besides the public library of 30,000 volumes, there are a library at the episcopal palace, museums of paintings, natural history, and physical science, a botanic garden, an observatory, public baths, and a theatre. There are various societies for literary and charitable purposes.

The arrondissement of Nantes has an area of 685 square miles, and comprehends sixty-six communes: the population, in 1831, was 205,627; in 1836 it was 205,892.

NANTUA. [AIN.]

NANTUCKET BAY. [MASSACHUSETTS.]

NANTWICH, or NAMPTWICH, a market-town in the hundred of Nantwich, in Cheshire, on the river Weaver, 192 miles from London on the road through Lichfield and Stafford to Chester. The first part of the name is said to be derived from *nant*, a British word signifying a brook or valley; the second part is an Anglo-Saxon corruption of the Roman *vicus*; and though locally assumed to be the appropriate designation of a salt-work, is in reality a general designation of a group of habitations, whether in town or country. The termination wick or wich, for it is written both ways, and is sometimes separate from the other part of the name, is found in the names of places (*e.g.* Green-wich, Wool-wich, Nor-wich, Ips-wich, War-wick, Aln-wick, &c.) which have no peculiar connection with the manufacture of salt.

Nantwich is mentioned in 'Domesday' by the simple designation Wich, and the salt-works are there mentioned. It was then enclosed by the river Weaver on one side, and on the other by a ditch. In 1069 Nantwich was the scene of an unsuccessful attempt by the Cheshiremen to resist the advance of the Normans under Hugh Lupus, earl of Chester. It was afterwards made the head of a Norman lordship, and the lords had a castle here, of which there are no remains. In 1438 and 1583 the town suffered considerably from fire. The damage on the last occasion was estimated at 30,000*l.* In the civil war of Charles I. the town was occupied by the Parliamentarians, from whom it was taken by Lord Grandison just before the battle of Edge Hill. Sir William Brereton, the parliamentary general, afterwards re-occupied it, and made it his head-quarters during the war. It was besieged (January, 1643-44) by a body of the king's troops, partly Irish, under Lord Byron; but though defended only by works hastily raised round the town, was gallantly held by the townsmen and others under Sir George Booth until the siege was raised, and the enemy entirely defeated by Sir Thomas Fairfax and Sir William Brereton.

The town is in a low flat situation, on the right or east bank of the Weaver. It is irregularly laid out, and consists of three principal streets, which unite near the church, and some others. The streets are indifferently paved, and the houses are commonly old, built of timber and plaster, with large bay windows and projecting upper stories. The church is a cross church, with a mixture of various styles of architecture. The west door is early English; the rest of the church decorated English or perpendicular, with some portions of a transition character between them. The nave has flying buttresses within, and is marked by some other peculiarities. The north transept has a fine decorated window; and the south transept and the choir or chancel, some fine perpendicular windows. The tower, which rises from the intersection of the nave and transepts, is an octagon of perpendicular date, with small crocketted pinnacles. It is small in proportion to the other parts of the church. The whole is of red-sandstone of friable texture. In the churchyard is an antient timber building, formerly the town-hall, but now used as a free-school. There is a market-house and town-hall, built in the last century, and a stone bridge over the Weaver. The dissenters have several meeting-houses, and there are several ranges of alms-houses.

The parish has an area of more than 3490 acres, with a population, in 1831, of 5357: it comprehends the whole townships of Alvaston, Leighton, Nantwich, Woolstanwood, and part of that of Willaston. Nantwich township comprehends 780 acres, with a population of 4886, scarcely any part of it agricultural. The prosperity of the town was formerly owing to its brine-springs and salt-works, which were of great celebrity and antiquity. Only one spring is now worked. The chief manufactures are of shoes, gloves, and cotton goods. The Chester, the Ellesmere, the Liverpool and Birmingham Junction canals, and the Middlewich branch canal, unite in the neighbourhood of the town; and the Grand Junction Railway passes at no great distance. The market is on Saturday, and there are three yearly fairs. The cheese made in the neighbourhood is highly esteemed. Petty-sessions for the hundred are held here; general quarter-sessions were formerly held here, but were removed to Knutsford in 1760. The town was once governed by a guild, but this was suppressed by Edward VI. The living is a rectory, in the diocese and archdeaconry of Chester, of the clear yearly value of 269*l.*, with a glebe-house.

There were in the township, in 1833, a day-school, with 65 boys, partly supported by endowment; another day-school, with 58 boys and 8 girls, partly supported by endowment and partly by payments from the children; fourteen other day-schools, with 431 children; and four Sunday-schools, with 836 children. The other townships contain only one day-school, with 30 children.

Major-general Harrison, one of the Regicides, who was put to death on the restoration of Charles II., was a native of Nantwich. Milton's widow was born in the neighbourhood, and died here at an advanced age in 1726.

(Ormerod's *Cheshire; Beauties of England and Wales; Parliamentary Papers.*)

NAPHTHA. [HYDROGEN—*Carburets.*]

NAPHTHALAMIDE. This compound is formed by heating naphthalate of ammonia in a retort; ammonia and water are disengaged, and naphthalamide sublimes, without

leaving any residue. This substance is colourless, inodorous, and insipid. It fuses when heated, and on cooling becomes a fibrous mass. When strongly heated it boils, emitting vapour, which condenses in crystalline plates. It is nearly insoluble in cold water, and but slightly soluble in hot; the solution deposits acicular crystals as it cools.

Chlorine does not act upon naphthalamide; heated concentrated sulphuric acid dissolves it, but when cooled and diluted, crystals of naphthalamide are deposited. Dilute acids do not act upon it; when boiled in a strong solution of potash, ammonia is disengaged; sulphuric acid separates the naphthalamide from the alkali.

According to M. Laurent this substance consists o.

Hydrogen	3·10
Carbon	64·65
Oxygen	23·35
Azote	8·90
	100·

NAPHTHALASE, a compound discovered by M. Laurent in 1835. It is prepared by mixing nitronaphthalase with about ten times its weight of lime, slightly moistened in a retort filled to the neck; when heat is applied, a brown oil is formed, containing much napththalin, some ammonia and undecomposed naphthalase, and in the neck of the retort a thick oil is condensed, which on cooling becomes solid; this is separated by cutting off the neck of the retort, and when washed with æther, the foreign matter is dissolved and the naphthalase remains.

Its properties are, that it is pulverulent, of a yellow colour, insoluble in water and alcohol, and nearly so in æther. At 482° it begins to sublime but does not melt; at a higher temperature it fuses and boils; the vapour is of a yellow colour, and it condenses either in yellow scales or needles. A small quantity dissolved in cold sulphuric acid imparts to it a fine deep violet-blue colour, and water precipitates it unaltered.

According to Laurent, it consists of

Hydrogen	4·8
Carbon	87·
Oxygen	8·2
	100·

M. Laurent considers it as nitronaphthalase minus an equivalent of hyponitrous acid.

NAPHTHALIC ACID, a compound obtained by a very tedious and complicated process from naphthalin by Laurent. Its properties are, that it is white, brilliant, and in long feathery crystals, which are four-sided prisms; it considerably resembles benzoic acid. It melts at 221°, and on cooling concretes into a fibrous mass, and when more strongly heated, it volatilizes without decomposition in a pungent white vapour, which is readily combustible.

This acid is devoid of smell, has little taste, is unaltered by exposure to the air, reddens moist litmus paper, is only slightly soluble in cold water, but dissolves to a considerable extent in hot water; alcohol and æther dissolve it readily. Chlorine has no action upon it, but hydrochloric, nitric, and sulphuric acid dissolve it while hot without decomposition.

According to M. Laurent, it consists of nearly

Two equivalents of Hydrogen	2	or	2·13
Ten equivalents of Carbon	60		63·83
Four equivalents of Oxygen	32		34·04
Equivalent	94		100·

The crystals contain one equivalent of water. Its saline compounds are called naphthalates, but they are not important.

NAPHTHALIN. [HYDROGEN—*Carburets*.]

NAPIER, JOHN, baron of Merchiston, was born at Merchiston Castle, near Edinburgh, in the year 1550, at which time his father was but sixteen years old. His lineage is traced from John de Napier, who, in 1296, swore allegiance to Edward I. of England: and among his more immediate ancestors are mentioned William Napier, governor of the castle of Edinburgh, and Alexander Napier, vice-admiral of Scotland. His father, Sir Archibald Napier, was master of the mint of Scotland. Napier was never raised to the peerage, as might be inferred from the writings of some authors, Briggs among others. (*Letter to Archbishop Usher*, vol. v., p. 432.) His name has been variously written. Besides the Latinized forms Neper and Neperus, we meet with Naper, Napier, and Nepair. The last is the orthography adopted in the title-page of Wright's translation of the logarithmic canon, which work was revised by Napier himself the year before his death. The name at the head of this article appears to have been the family name, and is certainly that by which he is now generally known.

Napier's matriculation into the university of St. Andrew took place in the year 1562-3, as appears from the books of the university. (See the 'Pursuit of Knowledge,' in the *Library of Entertaining Knowledge*, and the subsequently published Life of Napier, by Mark Napier, 4to., Lond., 1834.) That it took place early also appears from the following passage in the preface to his 'Plain Discovery of the Revelation of Saint John,' published at Edinburgh in 1593, 4to. Speaking of the university, he says, 'In my tender years and bairn age at schools, having on the one part contracted a loving familiaritie with a certain gentleman, a papist, and on the other part being attentive to the sermons of that worthy man of God, maister Christopher Goodman, teaching upon the Apocalyps, I was moved in admiration against the blindness of papists, that could not most evidentlie see their seven-hilled citie of Rome pointed out there so lively by St. John as the mother of all spiritual whoredom: that not only bursted I oute in continuall reasoning against my said familiar, but also from thenceforth I determined with myself, by the assistance of God's spirit, to employ my study and diligence to search out the remanent mysteries of that holy booke, as to this houre, praised be the Lord, I have bin doing at all such times as convenientlie I might have occasion.' One object of the 'Plain Discovery' was to show that the doctrines of the pope were antichristian, which so accorded with the views of the French Huguenots, that a translation of the work, stated in the title-page to have been revised by Napier, appeared at Rochelle in 1603, and the same year the council of Gap formerly declared the pope to be Antichrist. In the same work he fancies he has determined the dates at which the completion of the prophecies will take place, and he assigns the destruction of the world to the year 1786.

From the time of his entering the university to the publication of the above work, scarcely any thing is known concerning him. His biographers, David Stewart, earl of Buchan, and Walter Minto, about the close of the last century made inquiries among the descendants of Napier for letters or other documents which might throw light on his history during this long interval. Their exertions in this respect seem to have been attended with little success. MacKenzie, in his 'Lives and Characters of the most eminent Writers of the Scottish Nation,' fol., published at Edinburgh in 1708-22, informs us, but without mentioning any authority, that Napier passed some years in France, the Netherlands, and Italy, and that while absent he applied himself to the study of the mathematics. This is confirmed by his biographer, Mark Napier, who supposes him to have left Scotland as early as the year 1566, and adds that his college residence had been too short to entitle him even to the degree of B.A. In 1571 he had returned to Scotland. In 1593 he was chosen by the General Assembly one of the commissioners appointed to assemble at Edinburgh to counteract the attempts of the Roman Catholics to put aside Protestantism, then recently established. We are left to conjecture at what time prior to the year 1594 the mind of Napier first became occupied with the discovery of a method which should supersede the long and laborious arithmetical operations which the solution of the most simple trigonometrical problems then exacted. That he was thus occupied in the year 1594 is probable from a letter written by Kepler to Crugerus, dated 1624, wherein, speaking of Napier's logarithmic tables, which had then been published ten years, he says, 'Nihil autem supra Naperianam rationem esse puto: etsi quidem, Scotus quidam, literis ad Tychonem anno 1594 scriptis, jam spem fecit canonis illius mirifici.' (Kepl., *Epist.*, Lips., 1718, fol., p. 460.) The Scotchman here alluded to was Dr. Craig, of whom a circumstance is related by Wood, in his 'Athenæ Oxonienses,' under the article 'Briggs,' upon the authority of Oughtred and Wingate, and cited by several authors with reference to Napier's invention. The substance is this:—Craig, coming out of Denmark, called on Napier at Merchiston

and informed him, among other things, of a rumoured discovery by Longomontanus, 'as 'tis said,' whereby the tedious operations of multiplication and division in astronomical calculations were avoided; and intimated that this was effected by means of proportional numbers, of which information Napier availed himself so skilfully, that upon Craig repeating his visit a few weeks after, he showed him a draught of what he called canon mirabilis logarithmorum. The correctness of this story, as regards Longomontanus, is disproved by the fact that Longomontanus attributes the invention to Napier. (*Astronomica Danica*, p. 7, &c., quoted by Dr. Hutton.) There appears however to be no doubt that Craig did write to Tycho Brahe at the time stated, acquainting him with the progress which Napier had then already made.

Besides Longomontanus, several authors have been mentioned, and their works referred to, with a view to detract from the merit of Napier by bringing him in debtor to some of his contemporaries. All these attempts appear to proceed more or less on the supposition that the principle of logarithms was in Napier's time a novelty. The fame of Napier however does not rest on the discovery of that property of numbers upon which all the advantages of logarithms depend. Long before his time it was known that if the terms of an arithmetical and geometrical series were placed in juxta position, the multiplication, division, involution, and evolution of the latter would answer to and might actually be effected by a corresponding addition, subtraction, multiplication, and division of the former. To a certain extent this property was employed by Archimedes, in his 'Arenarius,' or treatise on the number of the sands. Stifel also, in his 'Arithmetica Integra,' Nürnberg, 1544, p. 35, exhibits its principal uses, and evinces so clear a conception of the nature of logarithms, only not under that name, that had he been furnished with a table of such numbers, he would doubtless have been able to make use of them. He might even have constructed a table, but the natural numbers would not have been consecutive, and the omissions would have been by far more numerous than the insertions, and this would have happened simply because he, in common with all other mathematicians previous to Napier, possessed no means of determining the logarithm corresponding to *any* proposed number, but merely those corresponding to particular numbers. Until such means were supplied, no table of any practical utility could have been constructed. Napier discovered the means, but had he not been of a peculiarly ardent disposition, he would have shrunk from the labour which their application required, and his discovery would perhaps have remained a mere sterile truth. It happened to him, as it has happened to most original discoverers, that the view which he took of the problem was not the most natural, and consequently not the most simple. The problem itself was purely arithmetical; Napier arrived at its solution through geometrical considerations. But notwithstanding this circumstance and the disadvantages he must have laboured under, arising from the imperfect methods of analysis then in use, and the almost total absence of notation, his processes even now are to a certain extent the most eligible, and are analogous to those employed in the construction of the great 'Tables du Cadastre.' 'Modern formulæ,' says Delambre, 'have furnished processes more sure and exact, but not more convenient.' (*Astronomie Moderne.*) Concerning Napier's principles we have not further to speak; the reader will find them explained in the article Logarithms.

With regard to the importance of the invention, and the claim of its author on the gratitude of his successors, we may cite the words of Laplace. (*Exposition du Système du Monde.*) 'By reducing to a few days the labour of many months, it doubles, as it were, the life of an astronomer, besides freeing him from the errors and disgust inseparable from long calculations. As an invention it is particularly gratifying to the human mind, emanating as it does exclusively from within itself. In the arts man avails himself of the materials and forces of nature; in this instance the work is wholly his.'

His tables were published in 1614, by the title of 'Mirifici Logarithmorum Canonis Descriptio,' Edinb., 4to. As their principal object was to facilitate trigonometrical computations, they contained only the logarithms of the natural sines corresponding to each minute of the quadrant and to radius = 10^7. The principle of their construction Napier at first withheld, 'waiting the judgment and censure of mathematicians before exposing the remainder to the malignity of the envious.' This explanation was given in a posthumous work, edited by his son, and published in 1619, Edinb., 4to. It is entitled 'Mirifici Logarithmorum Canonis Constructio: una cum annotationibus aliquot Doctissimi D. Henrici Briggii.' The two works were reprinted at Lyon in 1620.

From the date of the publication of the logarithmic canon until the death of Napier, which took place the following year, there is little recorded of him which demands particular notice, except his connection with Briggs, already noticed. [Briggs.] His 'Rabdologiæ, seu Numerationis per Virgulas, libri duo,' Edinb., 1617, 12mo., was the last of his literary productions. [Napier's Bones.]

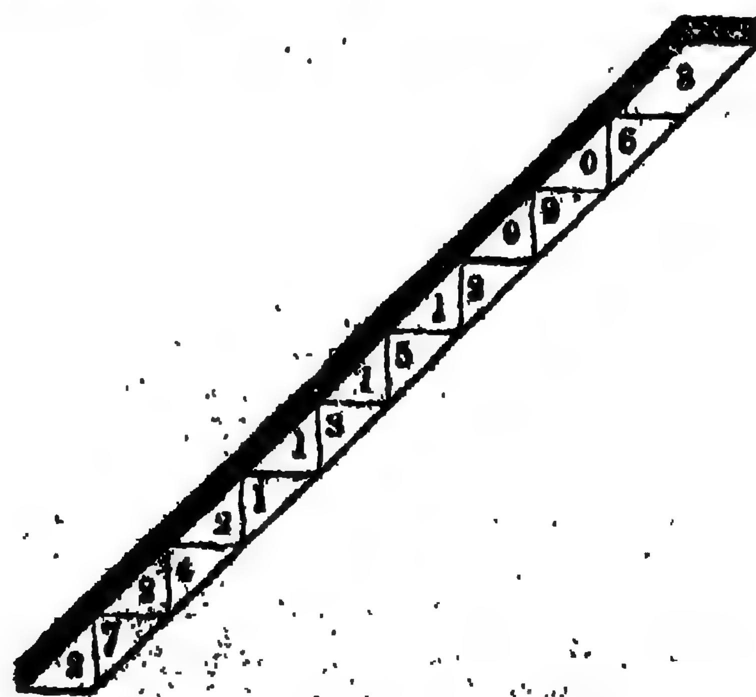
Napier died at Merchiston on the 3rd or 4th of April, 1617 (not 1618), old style, and was interred in the cathedral church of St. Giles at Edinburgh. On the eastern side of the cathedral is a stone tablet with a Latin inscription, indicating the spot of his interment. He was twice married. By his first wife, the daughter of Sir James Stirling of Kier, or Keir, he had one child, Archibald, who became privy-counsellor to James VI., and was raised by Charles I. to the peerage in 1627, by the title of Lord Napier. By his second wife, the daughter of Sir James Chisholm of Crombie, he had five sons and five daughters. To his third son Robert, to whom he had taught the mathematics, he confided the care of publishing his posthumous works.

Of Napier's improvements in trigonometry it is sufficient to refer to the elegant theorems known as Napier's 'Analogies' [Trigonometry], and to his theorem of the 'five circular parts,' which furnishes a ready solution of all the cases of right angled spherical triangles.

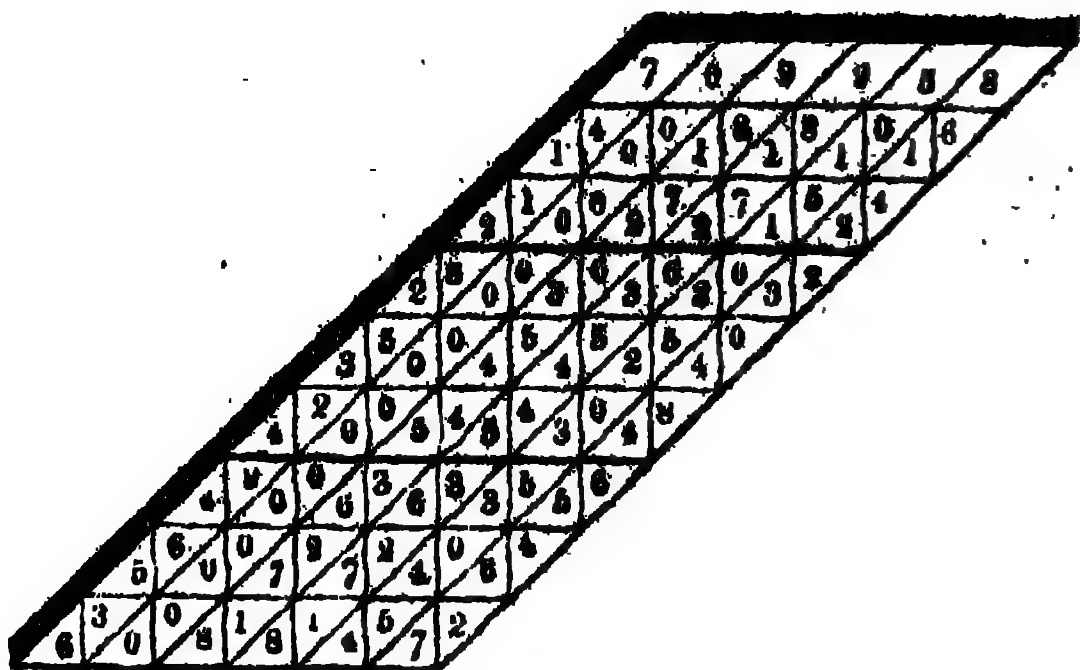
The only work of Napier not already mentioned is a letter to Anthony Bacon, entitled 'Secret inventions profitable and necessary in these days for the defence of the island, and withstanding strangers, enemies to God's truth and religion' (the original is in the archbishop's library, Lambeth; two copies are in the British Museum; it is also printed in Tilloch's 'Philosophical Magazine,' vol. xviii.). Watt, in his 'Bibliotheca Britannica,' adds 'Arithmetica Logarithmica,' Lond., 1624, fol.; but this is a mistake, Briggs being the author of that work.

(*Life, Writings, and Inventions of John Napier*, by David Stewart, earl of Buchan, and Walter Minto, LL.D., Perth, 1787, 4to.; Hutton's *Tracts*, &c.)

NAPIER'S BONES, or RODS, a contrivance of Napier to facilitate the performance of multiplication and division, explained by him in his 'Rabdologia,' published in 1617. The invention would have been perhaps more employed, but for his discovery of logarithms: and even yet it might be used with advantage by young arithmeticians in verification of their work. We shall therefore describe it, with a very slight modification, which somewhat facilitates its use.



The preceding cut represents one of the rods belonging to the number 3. It is a parallelogram with an angle of 45°, containing nine equilateral parallelograms, with one vertical diagonal in each. In these are distributed, in a manner which will be visible at a glance, the multiples of the number which stands at the head, up to nine times. A sufficient number of rods must be provided for each of the headings 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, so that by placing the proper rods side by side, any number may be seen at the head, as in the following diagram, which represents rods in juxtaposition ready for the multiplication of 708956



709958
32978
5679664
4969706
6389622
1419916
2129874
23412994924

If we wish to multiply by 32978 we look at the eighth column of multiples, in which we see the following disposition of figures (which however it is not necessary to write down afresh)

602204
507746

These may be added on the rods, and the result 5679664 written down in its proper place. The same is done with the other digits, and the results are added in the usual manner.

The only difference between the preceding description and Napier's rods is, that in the latter the rods are upright, and the additions that are made from the rods are therefore made diagonally. The compartments should be made large enough to allow of the figures which are to be added standing directly under one another.

Napier's *bones*, as they were called, have been much more often described in historical works than in those intended for use. Sir Walter Scott must have had an indistinct remembrance of them, without however knowing what the phrase meant, when he made Davie Ramsay, in the 'Fortunes of Nigel,' swear by 'the bones of the immortal Napier.'

NAPLES, KINGDOM OF, REGNO DI NAPOLI, is the name commonly given to the Continental part of the united kingdom of the two Sicilies, which, in the administrative language of the country, is styled 'Sicilia Citeriore' (hither Sicily), or 'Dominj di quà dal Faro' (territories on this side of the Straits of Messina). This fine region occupies the southern half of the Italian peninsula, being bounded on the north-west by the Papal State, and on every other side by the sea. The frontier line between the kingdom of Naples and the Papal State begins on the coast of the Mediterranean, at the tower 'Dei Confini,' which is a mile or two south-east of Terracina, where the mountains recede from the sea, and at the opening of the basin of the lake of Fondi. The boundary-line then follows an offset of the ridge of the Lepini mountains as far as the valley of the river Sacco, an affluent of the Liris, which opens a natural road into the kingdom. Crossing that valley, the line proceeds first in a northern and afterwards in a north-north-western direction, along several ramifications of the Apennines, which divide the waters of the Liris from those of the Anio; then ascending the loftier group which, to the west, bounds the basin of the lake Fucino, it descends by following the downward course of the river Salto into the valley of the Velino, crosses that river a little to the east of Rieti, which belongs to the Papal State, and then again ascends, crossing the backbone or central ridge of the Apennines between the sources of the Nera and those of the Tronto. Descending along the eastern slope of the central ridge, the line follows an offset which skirts the right bank of the Tronto, and afterwards, below Ascoli, the river itself forms the boundary down to the Adriatic. The whole of this tortuous boundary-line is about 150 English miles, but the direct distance, from its extreme point on the Mediterranean to the corresponding point on the Adriatic coast, is not quite 120 miles. Four roads, which are ultimately reduced to two, lead into the kingdom: one by Terracina to Fondi, along the coast of the Mediterranean; the second from Rome, by Palestrina and the valley of the Sacco, into the valley of the Liris, and from thence into the valley of the Volturno, where it joins the former; the third, by Rieti, Civita Ducale, and Antrodoco, to Aquila and the valley of the Pescara; and the fourth by Ascoli to Teramo, and along the coast of the Adriatic to the banks of the Pescara likewise. It is a remarkable fact that the boundaries of the kingdom of Naples, since the foundation of the Sicilian monarchy by the Normans, about eight centuries ago, have not varied throughout all the political vicissitudes of the country.

The greatest length of the kingdom of Naples, from the Tronto to Capo Spartivento at the southern extremity of Calabria, is about 400 miles, in a curved line running through the centre of the peninsula. Its breadth from sea to sea varies greatly. In its northern part, from the mouth of the Garigliano to that of the Pescara, it is about 85 miles wide: farther south, from Capo Misenum near Naples, to the mouth of the Fortore, on the Adriatic coast, it is 100 miles; and from Naples to Vietri, on the promontory of Mount Gargano, it is 125 miles. From Naples to Manfredonia it is about 100 miles. South of Naples the gulf of Salerno on one side, and that of Manfredonia on the other, reduce the breadth of the peninsula to 83 miles; but farther south it again widens from the point of Licosa near Pæstum, to Mola di Bari, on the Adriatic, a distance of 130 miles, which is the utmost breadth which the kingdom of Naples attains, but in which we do not include the length of the Iapygian peninsula, which projects in an oblique direction to the line of breadth measured across the main body of the peninsula of Italy. The length of the Iapygian projection is nearly 90 miles, with a mean breadth of 30 miles: the description of this district is given under OTRANTO, TERRA DI.

The breadth of the kingdom again becomes contracted between the deep gulf of Taranto on one side and that of Policastro on the other, it being about 65 miles from the mouth of the Bradano to that of the Trecchina. [BASILICATA.] It becomes still narrower as we advance southwards into Calabria: it is 45 miles between the gulf of Lao and that of Taranto, and 35 from the mouth of the Cratis to Cape Cetraro, after which it widens again to near 60 miles for a length of about 50 miles. South of the Lacinium promontory, now Capo delle Colonne, the land becomes contracted into a narrow isthmus about 14 miles across, between the gulfs of Squillace and Sant Eufemia, beyond which it spreads again to a breadth of 25 to 35 miles throughout the length of the province of Calabria Ultra. [CALABRIA.]

The area of the kingdom of Naples is estimated at about 31,600 square miles, or about 2700 square miles more than the area of Ireland. The population consisted in 1815 of 5,059,000 inhabitants; in 1825 it had increased to 5,456,664; in 1832 it was 5,809,000; and in 1837 it ascended to 6,021,284. (Petroni, *Censimento dei Reali Dominj di quà dal Faro*, 1826; Serristori, *Saggio Statistico dell' Italia*, 1833; *Bollettino Statistico di Milano* for January, 1839.) Of this population more than two-thirds, or about four millions, live by agriculture, about half a million by manufactures and other mechanical labour, another half million by trade, including sailors and fishermen; the priests, monks, and nuns amount to about 40,000; lawyers 8000; medical men 9000; persons employed under government 30,000; the military amount to 40,000; household servants to 50,000. The illegitimate children are to those born in wedlock as 1 to 22; but in the capital they are as 2 to 13.

The main features of the physical geography of the kingdom are—1, the Apennines, which run through the centre of the country, forming in several parts large masses and high table-lands, which, with their numerous offsets, occupy, especially in the southern part, the whole breadth of the peninsula [APENNINES]; 2, two extensive plains, Apulia and Campania, the former to the east and the other to the west of the Apennines; 3, numerous valleys between the offsets of the Apennines, of which those on the side of the Adriatic are mostly transverse, while on the side of the Mediterranean the valleys of the Volturno, and its affluents the Calore, Sabbato, and Tamaro, and the valley of the Tanagro, an affluent of the Sele, and some others, are longitudinal, running between ridges parallel to the central chain; 4, a strip of

low land along the coast between the base of the mountains and the sea, varying in width from ten miles to one mile, and in some places even less, especially in Eastern Calabria, and some parts of Abruzzo, where the mountains advance close upon the sea. This low region is hot and naturally fertile, but unwholesome in many parts and exposed to inundations from the mountain-torrents.

The principal basins or water-systems are—1, that of the Liris, or Garigliano, which is about 60 miles long, not reckoning the windings of the river, from its source at Mount Camicciola, in the Abruzzo, to its æstuary near the site of antient Minturnæ. The breadth of the basin in the upper course of the river is much contracted between the central Apennines to the east and the Sabine mountains to the west, which latter divide it from the basin of the Anio, but after passing Sora it spreads to about 20 miles in breadth, including the courses of the Fibreno, Melfa, Rapido, Frigido, and other affluents. It also drains part of the Papal province of Campagna through the channel of the river Sacco. The Garigliano is a deep river, always full of water, and is navigable for boats in the lower part of its course. West of the basin of the Garigliano, and separated from it by the mountains of Itri, is the small basin of Fondi, containing a low plain of about 50 square miles in extent and drained by the small river Vetere. 2. The basin of the Volturno is the largest and most important in the kingdom. The Volturno drains the greater part of the province of Terra di Lavoro, and its affluent the Calore is the drain of Principato Ultra, making in all an area of nearly 3000 square miles. The Volturno has a tortuous course of nearly 100 miles, and the Calore runs for about 60 miles before its junction with the Volturno. 3. The fertile plain east of Mount Vesuvius and between it and the Apennines forms a small basin, which is drained by the river Sarno. 4. The basin of the Sele and its affluent the Tanagro includes the greater part of the province of Principato Citra and a part of that of Basilicata which lies west of the central ridge. The Sele has a course of about 60 miles altogether, and the Tanagro a course of about 35 above its junction. South of the basin of the Sele, the peninsula becomes narrow, the Apennines come close upon the sea, and the course of the rivers towards both coasts is very short. In fact Calabria has numerous mountain-torrents, each of which drains its narrow valley. An exception however is found in 5. The basin of the Crati in Calabria Citra. The Crati has its source south of Cosenza, in the high lands of La Sila, a vast group projecting east of the main ridge of the Apennines and extending towards the coast of the gulfs of Taranto and Squillace. The Crati flows in a north direction between the main ridge to the west and the mountains of La Sila to the east, draining the fine valley of Cosenza; turning eastwards after passing the town of Tarsia, it enters the gulf of Taranto. Its whole course is about 60 miles, and it is the largest river of Calabria. 6. The basin of Basilicata, with its four parallel rivers, the Agri, Sinno, Bradano, and Basiento, is fully described in the article BASILICATA. East of Basilicata, the narrow Iapygian peninsula, which is intersected in its length by a low barren ridge, has no water-courses of any importance; and this is also the case with the province of Terra di Bari. 7. The Ofanto, one of the principal rivers of the kingdom, rises in the Apennines of Conza within the boundaries of Principato Ultra; it drains the part of that province which lies east of the Apennines, and also the northern part of Basilicata, as well as a part of Capitanata and Terra di Bari, and after a course of above 70 miles enters the Adriatic. It receives no affluents of any importance. 8. The great plain of Apulia is drained by the Carapella, Cervaro, and Candelaro, the courses of which are nearly parallel, and run from the central Apennines to the sea. The Candelaro has several affluents, and drains a considerable tract of country between the group of Mount Gargano and the Apennines of Lucera and San Severo. 9. The Abruzzi contain numerous and rapid streams which run direct to the sea along deep valleys between lofty parallel ridges; but there are no extensive basins, with the exception of that of the river Pescara, which has a course of above 80 miles, and receives on one side the waters of the central chain of the Apennines, including Mount Velino, which runs north of Lake Fucino, and on the other those of the lofty mass of Monte Corno, which projects eastwards towards the Adriatic coast and has snow on its summit almost the whole year. The Pescara above the middle of its course passes through a narrow defile near the town of Popoli and turns eastwards towards the Adriatic, receiving from the south the waters of another great outlying group of Apennines, called Mount Majella, in the province of Chieti. 10. The basin of Lake Fucino, or Celano, in the centre of the peninsula, is surrounded by mountains on every side. The lake, which is 16 miles long and nine miles broad, receives the waters of about 400 square miles, mostly of high lands covered with snow for a great part of the year, and yet it has no visible outlet. But there are subterraneous drains from the bottom of the lake, which is much higher than the neighbouring valleys of the Liris on one side and the upper Pescara on the other. On the side of the Liris the intervening ridge about Capistrello is much depressed, and there the 'emissary' or tunnel was made in the time of the emperor Claudius, which is now in course of repair. The Liris runs in a deep narrow valley about three miles from the lake. [CELANO.]

The kingdom of Naples has a coast-line of about 1500 miles in length, two-fifths of which lie on the west or Mediterranean sea, and the rest on the Ionian and Adriatic seas. The Ionian sea, according to the Italian denomination, extends from the Straits of Messina to Cape Leuca, at the extremity of the Iapygian peninsula. Unfortunately this very extensive line of coast has few harbours. The deficiency of tides in the Mediterranean renders the æstuaries of rivers useless for the purpose of navigation; and this is a great and lasting disadvantage to the countries round that sea, which alone would determine their maritime inferiority to the countries bordering upon the ocean. The Garigliano, Volturno, Sele, Crati, Ofanto, Pescara, and other rivers of the kingdom of Naples, if they were tide rivers, would afford good natural harbours for large vessels, whilst, as it is, the bars at their entrance are impassable except for very small craft. The only harbours on the Mediterranean coasts are those of Gaëta and Naples, and even these are not safe at all times, and do not admit of large vessels. But the Gulf of Baiæ, in the Bay of Naples, affords a safe anchorage for the largest men of war. The natural port of Misenum, although not used now, is still capable of receiving large merchant vessels. South of Naples, as far as the Straits of Messina, there is no harbour. The artificial port of Salerno is filled up with sand, which has been the fate of most harbours on the coast of the kingdom, wherever a mole has been constructed. To prevent this evil, it has been proposed to raise, instead of continuous moles, piers made of arches, as the antients did at Puteoli, which, by leaving free ingress and egress to the waters, would prevent the constant accumulation of the sand. (De Fazio, *Nuove Osservazioni sopra i Pregj Architettonici dei Porti degli Antichi*, 1832.) On the eastern coast are the ports of Taranto and Brindisi; Gallipoli has merely a roadstead; the ports of Trani and Barletta are filled up, but Manfredonia has a very good road. A new harbour has been begun at Bari. On all the coast of Abruzzo there is no harbour; the mouth of the Pescara and the mole of Ortona afford shelter only for small craft. A new harbour is in course of construction at Ortona. The coast of the Abruzzo is generally shallow, except at the point of Termoli, where there is deep water, and the position is favourable to the construction of a harbour which has been projected. (Afan di Rivera, *Considerazioni sù i mezzi di restituire il valore proprio ai doni che la natura ha largamente conceduto al Regno delle due Sicilie*, 2 vols., 1833.)

The productions of the soil throughout the kingdom are various. The staple products are corn, wine, oil, wool, and silk. The plains of Apulia produce vast quantities of corn for exportation. A quantity of wool is exported from the same province, where about two millions and a half of sheep are fed. [CAPITANATA.] Oil is likewise exported from the eastern provinces and from Calabria, to the amount of about nineteen millions of Italian livres, or about 750,000*l.* sterling. Gallipoli is the great oil mart. Silk is made in Calabria, in Abruzzo Citra, Terra di Lavoro, and Principato. Cotton is produced in the provinces of Bari, Principato, near Castellamare, and other places. Wine is made all over the kingdom, and in great abundance and variety, but most of it is consumed in the country and within the year; and although some of the wine, especially that of Calabria, is as full bodied and generous as any Portuguese and Spanish wine, yet little of it is kept or sent to the northern parts of Europe. Naples however exports wine to Rome, Genoa, and other parts of Italy. Some brandy is made and exported to America. Some of the wines made in the

neighbourhood of Naples, at Piedimonte, Procida, Capri, Gragnano, and at the foot of Mount Vesuvius (the latter is known by the name of 'Lachryma Christi'), are very fine and well flavoured. The country produces most kinds of fruit, such as figs, chesnuts, almonds, oranges, lemons, pomegranates, melons, peaches, and apricots. The Indian fig comes to maturity in Sicily, but not in the continental part of the kingdom. Tobacco is cultivated chiefly near Lecce, saffron in Abruzzo, and the sugar-cane in Calabria. Flax, hemp, and rice are also raised in considerable quantity in the low grounds. Indian corn is also much cultivated. Cheese is made chiefly in Abruzzo and Apulia. In some favoured spots, such as in the neighbourhood of Naples, at the foot of Mount Vesuvius, near Monteleone and Reggio in Calabria, the fertility of the soil seems inexhaustible.

There is a rich iron-mine near Stilo in the farthest Calabria, which is worked for the government. Coal is found also in Calabria near Briatico (Vivenzio, *Relazione dei Terremoti di Calabria*, Naples, 1788; Savaresi, *Viaggio in Calabria*, 1801-2; Tenore, *Essai sur la Géographie physique et botanique du Royaume de Naples*, 1827.)

The forests with which the Apennines were once clothed have in great part disappeared through the waste, improvidence, and neglect of the people and the various governments which have succeeded each other in the country. This is a very serious evil, for not only fuel and timber have become scarce, but the destruction of the forests has caused the springs to be dried up and occasioned summer droughts in the subjacent lands, whilst the winter rains have washed away the vegetable earth from the mountain sides and exposed the bare rock, and the torrents carrying down alluvial matter into the valleys and plains have damaged whole tracts of country, choked up the beds of rivers, and occasioned the formation of pestilential marshes. Afan di Rivera, already quoted, has shown at great length the calamitous effects of the destruction of the Apennine forests. By a law concerning the forests, promulgated on the 21st August, 1826, an attempt has been made to arrest the progress of the evil.

The strip of maritime low land which skirts the sea-coast is in many places marshy and covered with underwood. Herds of black cattle, buffaloes, and pigs live in that unwholesome region. Something has been done of late years towards draining the marshes, especially between the mouth of the Volturno and Cuma, and on the opposite coast of Apulia. [BRINDISI; CAPITANATA.]

At the beginning of the present century there was no carriage-road through the kingdom, with the exception of the high road from Rome to Naples. Since that time roads have been made from Naples to Reggio at the extremity of Calabria, to Bari, Manfredonia, and Taranto in Apulia, to Chieti, Teramo, and Aquila in Abruzzo, to Potenza in Basilicata, to Campobasso in the province of Sannio, and other roads are in course of being constructed. A handsome suspension-bridge has been thrown across the Garigliano, which, although on the high road from Rome to Naples, had been crossed for centuries before only by a miserable ferry.

The kingdom is divided for administrative purposes into 13 provinces. We subjoin the population of each, as it was by the last authentic returns which we have seen, of 1837, which, compared with those of Petroni for 1825, show that the population has been gradually increasing at the average rate of about 1 per cent. annually: Provincia di Napoli, 720,796 inhabitants; Terra di Lavoro, head town Caserta, 664,138 inhabitants; Principato Citra, head town Salerno, 539,227; Principato Ultra, head town Avellino, 379,909; Sannio, formerly called Contado di Molise, head town Campobasso, 339,882; Abruzzo Citra, head town Chieti, 284,482; Abruzzo Ultra Primo, head town Teramo, 204,092; Abruzzo Ultra Secondo, head town Aquila, 299,543; Capitanata, head town Foggia, 273,489; Terra di Bari, head town Bari, 441,964; Terra d'Otranto, head town Lecce, [illegible]; Basilicata, head town Potenza, 457,522; Calabria Citra, head town Cosenza, 434,622; Calabria Ultra Primo, head town Reggio, 293,856; Calabria Ultra Secondo, head town Catanzaro, 325,122. In common discourse, these divisions are often called by the name of the head town, such as 'Provincia di Salerno,' 'Provincia di Lecce,' 'Provincia di Teramo,' &c. The provinces are divided into districts, and the districts into communes. Each province is administered by an 'intendente,' or king's lieutenant, appointed by the king, and changed every three years. In every province there is a 'Consiglio provinciale,' or a council of notables, proposed by the communal councils, and appointed by the king, which assembles once a year, and examines the provincial accounts and proposes local improvements. Keppel Craven, the latest authority on the subject, who has visited at leisure every province of the kingdom speaks favourably of the character, qualifications, and general behaviour of the intendenti. The same praise however ought not perhaps to be extended to the subaltern or district and police authorities. Every commune has a sindaco, who corresponds to the maire of the French communes. A communal council, called 'Decurionato,' chosen by ballot from among the notables or proprietors, fixes the local rates, administers the revenue, and appoints the municipal officers, subject however to the sanction of the intendente. One of these officers is called 'conciliatore,' and acts as umpire between parties at variance, for the purpose of preventing them from going to law upon trifling grounds. (Serristori; Colletta, *Storia del Reame di Napoli*; Orloff, *Mémoires sur le Royaume de Naples*.)

The judicial department consists of four 'Gran Corti Civili,' which sit at Naples, Aquila, Trani, and Catanzaro; a criminal court, and a civil court in every head town of a province; and a judge of instruction in every district, and a justice of peace, 'giudice di circondario,' in every 'giudicatura inferiore,' of which there are 525 in the whole kingdom. A supreme court of cassation, 'Corte Suprema di Giustizia,' sits at Naples. Trials are public in the kingdom of Naples, as in France. The French civil code, with some modifications, has been retained, as well as the French commercial code.

For the purposes of public instruction, there is an elementary school in every commune; grammar schools, 'scuole secondarie,' in most towns; a royal college in every head town of a province; five lycea at Naples, Salerno, Aquila, Bari, Catanzaro; and, lastly, the university of Naples. There is a very good institution at Naples for the education of young ladies, founded by Caroline, Murat's wife, and since patronised and increased by Queen Isabella, the wife of Francis I.; but the education of females in general is much neglected.

The ecclesiastical establishment consists of 20 archbishops and 65 bishops, 72 clerical seminaries, and 3767 rectors of parishes. The number of priests, monks, and nuns has been stated above. Serristori, in 1833, reckons the monks at 11,000, and the nuns at 9000; but Petroni, in 1826, reckoned the former only at 8455, and the nuns at 8185. It is possible that the monks may have increased since the former date. The ecclesiastical jurisdiction and discipline were defined by a concordat agreed upon between Cardinal Consalvi on the part of the pope Pius VII. and the Cavaliere de' Medici for king Ferdinand I., in March, 1818. The Roman Catholic is the exclusive religion of the country; a Protestant chapel has been of late years tolerated in the capital, for the accommodation of foreigners. Several communes in Calabria, Apulia, and Abruzzi follow the Greek ritual, but they belong to the Latin communion, and acknowledge the pope as their spiritual head.

The history of the kingdom and the present constitution of the monarchy are given under SICILIES, TWO, KINGDOM OF THE.

The inhabitants of the countries composing the kingdom of Naples are derived from various and mixed races. The descendants of the antient Samnites, Peligni, Marsi, Frentani, Lucanians, and other people of old Italian origin; the Etruscan Campanians, the wild Bruttii, the Greek population of the coasts—of Magna Græcia, of Cuma and Neapolis—after having been fearfully thinned during their contest with Rome, the war of Pyrrhus, the second Punic war, the social war, and the civil war of Marius and Sulla, became mixed with numerous Roman and Latin colonies. The antient Oscan and Samnite languages were gradually lost, but the Greek still remained a spoken language over a great part of the maritime districts. At the fall of the empire, the country was overrun rather than occupied by the northern tribes, but afterwards returned to the allegiance of the Byzantine emperors, when it received a fresh admixture of Greek blood and Greek language and Greek usages. In the sixth century the Longobards took possession of Beneventum, and founded there a powerful duchy, which survived the fall of their power in North Italy. In the eleventh century the Normans came, who conquered both the Longobards and the Greeks, and founded the

monarchy of the two Sicilies upon the base of feudal institutions. Then came in succession the Suabians, the French or Provençals, the Aragonese, and the Spaniards. All these nations have left traces of their residence. A dash of Greek character is still observable in the temper, customs, and dialect of several parts of the country. Some families trace their descent from the Normans and the Angevins or Provençals. Lastly, Spanish family names, Spanish habits, and Spanish words often occur, especially in the capital. Considerable shades of variety are observable among the inhabitants of different parts of the kingdom [ABRUZZO; CALABRIA]; whilst the capital, from the constant influx of provincials, contains specimens of them all. But notwithstanding these varieties, the long habits of amalgamation produced by a central administration and a large capital during eight centuries have created a lasting feeling of common nationality, which is perhaps stronger in the kingdom of Naples than in any other Italian state. Neapolitan, not Italian, is the national appellation. Generally speaking, the Neapolitan is quick, shrewd, humorous, fond of music and dancing, rather inclined to bombast and hyperbole, fiery but changeable, inclined to pleasure and ease, hospitable, susceptible of generous feelings, and also of a high social polish.

Notwithstanding the common prejudice to the contrary, the Neapolitan is by no means deficient in personal courage. During the last wars, Neapolitan troops fought well as auxiliaries in the ranks of the French, Austrian, and English armies; the people also fought desperately in defence of their capital in 1799; and the long and obstinate war in Calabria, from 1806 to 1810, was only put down by extermination. If the regular troops have not shown the same spirit in defence of the kingdom, this has proceeded from various peculiar circumstances which are fairly explained by Colletta in his 'History' already quoted, and likewise by the author of a work lately published at Florence, 'Fasti e Vicende dei Popoli Italiani, dal 1801 al 1815.' See also the *Antologia Militare*, of which the sixth volume has been lately published at Naples.

NAPLES, PROVINCE OF (Provincia di Napoli), is the name of the metropolitan province of the kingdom of the two Sicilies, which includes the capital [NAPLES, CITY OF] and the territory round the bay from Cape Misenum and Cuma on the west to Castellamare and Sorrento on the south-east. The islands of Ischia and Procida belong also to the province of Naples. The province is divided into four districts: 1, Naples; 2, Pozzuoli, which includes the whole western division and the islands; 3, Castellamare, which comprises the territory at the base of Mount Vesuvius, and the coast opposite Naples as far as Sorrento; 4, Casoria, which comprehends a tract of the Campanian plain stretching north of the range of hills behind the city of Naples. This tract extends as far as a line which, beginning on the sea-coast half way between the lakes of Licola and Patria, runs in an eastern direction to Caivano, not including the town of Aversa, which belongs to the province of Terra di Lavoro: it then runs south-east skirting the north base of Mount Vesuvius, and not including the towns of Acerra, Nola, and Nocera: it next follows the ridge of hills which runs through the peninsula of Sorrento at the back of Castellamare, including the towns of Castellamare, Vico, and Sorrento. The summit of the ridge divides the province of Naples from that of Principato Citra, or province of Salerno. The whole of this territory formed until lately part of the larger division of Terra di Lavoro, from which it is not geographically separated; but owing to the great population of the capital and surrounding territory, it has been found convenient for administrative purposes to constitute it into a distinct province. The province of Naples, exclusive of the capital, contained, according to the returns of 1837, 374,494 inhabitants.

The principal towns of the province of Naples, exclusive of the capital, are: 1, Pozzuoli, the antient Puteoli, situated on the east side of the gulf of the same name, and opposite to Baiæ, originally a colony of Cuma, called Dicæarchia, founded in the sixth century B.C., and now a bishop's see and a poor-looking town, with 10,000 inhabitants. [POZZUOLI.] The whole surrounding country is of a volcanic character. The hill called Solfatara, which is the crater of a volcano not yet extinct, rises to the east above the town. 2, Afragola, a large village or town of 13,000 inhabitants, north-east of Naples in the Campanian plain, has some hat manufactories. 3, Fratta Maggiore, near the antient Atella, is famous for its strawberry beds, which supply the markets of Naples. 4, Somma, at the north base of Mount Vesuvius, has 7000 inhabitants. 5, Sant' Anastasia, near Somma, has 6000 inhabitants. The whole neighbourhood produces the luscious wine known by the name of 'Lachryma Christi.' 6, Portici and Resina, two adjoining towns built on the south-west slope of Vesuvius, on the site of Herculaneum, contain together about 14,000 inhabitants. Visitors who ascend Mount Vesuvius pass through Resina. Portici has a royal palace; its museum of antiquities obtained from Herculaneum and Pompeii has been lately removed to the Museo Borbonico at Naples. East of Resina is another pretty royal villa called La Favorita, in a lovely situation near the sea-shore. 7, Torre del Greco, about two miles south-east of Portici, at the foot of Vesuvius, a town of 12,000 inhabitants, has been repeatedly destroyed by the lava and earthquakes, but rebuilt over and over again. The inhabitants are mostly addicted to a seafaring life. 8, Torre dell' Annunziata, about four miles south-east of Torre del Greco, and near the site of Pompeii, has 9000 inhabitants, a manufactory of muskets for the royal service, and a large gunpowder magazine. It is also known for its great manufactory of maccaroni, which is the best in Naples, and known by the name of 'Maccaroni della Costa.' North of Torre dell' Annunziata is the large village of Bosco trè Case, and further north, on the east slope of Vesuvius, is the town of Ottajano, with 15,000 inhabitants. 9, Castellamare, at the south-east extremity of the Bay of Naples, near the site of Stabiæ, is in a delightful situation on the sea-coast, at the foot of the lofty mountain St. Angelo, the Mons Lactarius of the antients, nearly 5000 feet high: it has docks for the royal navy, several sources of mineral water in the neighbourhood, a royal villa called 'Quisisana' and park, and about 10,000 inhabitants. Castellamare is much frequented by the Neapolitans during the summer heats. In the neighbouring district of Gragnano a wine is made which is among the best in the neighbourhood of Naples. 10, Vico (Vicus Æquanus), a small town perched upon the cliffs above the coast, about 4 miles south-west of Castellamare, was the birth-place of the metaphysician and historian Gianbattista di Vico. 11, Sorrento is in a delightful valley surrounded by hills, which is a complete grove of orange and mulberry trees, and contains several villages and numerous country-houses. The town of Sorrento has 5000 inhabitants, is a bishop's see, and the birth-place of Tasso. The plain of Sorrento is much frequented by the wealthy Neapolitans during summer. There are boats which cross daily from Naples to Sorrento, and return loaded with oranges and other fruit. Silk is also produced here.

The country round Naples is the most populous neighbourhood belonging to any capital in Europe, excepting perhaps that of Paris. For particular descriptions of it see AGNANO; AVERNO; BAIÆ; CUMA; HERCULANEUM; ISCHIA; POMPEII; POZZUOLI; VESUVIUS.

NAPLES (*Napoli*, in Italian), the capital of the kingdom of the Two Sicilies, and the fourth in population among the European cities, is situated in 40° 50′ N. lat. and 14° 13′ E. long., on the northern coast of the fine bay of the same name, and partly at the foot and partly on the slope of a range of hills which runs obliquely to the shore. On the south-east is Mount Vesuvius, from which it is divided by a fertile plain watered by the small river Sebéto, and opposite to it, across the bay, are the mountains of Castellamare, Vico, and Sorrento, with the island of Capri due south, at the entrance of the bay, on the side of Sicily.

Seen from the sea Naples appears in the form of two crescents, of very unequal depth, one on the east, and the other on the west, divided by the point of Castel dell' Uovo and the hill of Pizzofalcone, which is behind it. The eastern crescent, which includes the great bulk of the city, faces the south-east, and is bounded by the hill of Capodimonte to the north, and Sant' Elmo or Ermo to the west, crowned by the castle of that name, which commands the town. Between these two hills is a considerable depression, on which the suburbs of La Sanità and L'Infrascata are built. The slope of the hill of Capodimonte is likewise covered with houses, forming the suburbs called Miracoli and Le Vergini. To the eastward the town is open to the plain of Campania. From the barrier of Capo di Chino, at the entrance from Rome, a succession of fine streets run through the body of the town to the sea, the principal of which, called Toledo, about a mile in length, runs due south, and divides the old city, which is east of it, from the new districts. The street of Toledo terminates in the *place*

before the royal palace. The old city forms a closely built square of about a mile on each side: part of its walls, towers, and ditches still remain, and several of the gates are standing, namely, Porta Nolana, on the road to Nola, Porta Capuana, on the road to Apulia, and Porta S. Gennaro, and Porta S. Maria di Constantinopoli, towards the north. This part of the town, which is in a plain, has narrow streets and lofty massive houses, many of them six or seven stories high; it is very thickly inhabited, and contains more than one half of the whole population of the capital. West of Toledo numerous streets run up the hill of Sant' Elmo, which is covered with houses for two-thirds of its height. South of the hill of Sant' Elmo, and between it and the point of Pizzofalcone, is another depression, which affords a carriage communication between Toledo and the western crescent, or new part of the town, which is called by the general name of Chiaja, 'the quay.' This part, which is much contracted between the hills and the sea, extends in length about a mile and a half between the hill of Pizzofalcone to the east and that of Posilipo to the west. A fine road runs all this length, parallel to the sea-shore, and between the public gardens on one side and a row of fine houses on the other; it then turns along the base of Mount Posilipo, and gradually ascending it, leads to the other side of it towards Pozzuoli. There is another and straighter road to Pozzuoli by the tunnel called Grotta di Posilipo, which is cut through the mountain for about three-quarters of a mile.

Naples is an open city like London, but it has a sort of barriers or custom-house posts at the principal avenues leading into the town, for the purpose of collecting the 'gabella,' or duty upon provisions, corresponding to the 'octroi' of the French and other continental towns. The extreme length of Naples, measured along the sea-coast, but without following its sinuosities, is about three miles and a half from the Ponte della Maddalena, on the road to Calabria, to the grotto of Posilipo: the greatest depth, from the suburb of La Sanitá, at the foot of Capodimonte, to the shore of Santa Lucia, is about two miles; but in other directions it is much less.

Few buildings at Naples are in a good architectural style; they are either overloaded with ornaments or disproportionate in their parts. The most remarkable are—

1. The royal palace, 'La Reggia,' a large mass of buildings, constructed at two different times, first by the viceroy Pedro de Toledo, which part goes by the name of Palazzo Vecchio; and the second, after the design of the architect Fontana, under the Spanish viceroy Count De Lemos, in the seventeenth century. This new palace has a front of nearly 400 feet in length, with three orders of pillars, one above the other, Doric, Ionic, and Corinthian. The great court has two rows of arcades, one above the other, supported by granite columns; the grand staircase is ample and commodious. The apartments are adorned with valuable paintings of the old Italian masters. The great gallery contains the portraits of all the Spanish viceroys who presided over Naples for more than two centuries. At the back of the palace, along the first floor, facing the sea, is a handsome terrace paved with marble and shaded with trees, from which there is a delightful view of the bay. On the ground-floor are the royal printing-press and the royal china manufactory. Facing the palace is a semicircular colonnade, with a pantheon-shaped church in the centre, raised by the late king Ferdinand I.

Adjoining the palace, and between it and the sea, are the arsenal, the cannon-foundry, and basin, or wet-dock, for the king's barges or yachts. On the eastern side the palace adjoins the theatre of San Carlo, which is one of the remarkable structures of Naples. It was rebuilt after the fire of 1815, and is one of the largest theatres in Europe; it has six tiers of boxes, each box capable of containing from ten to twelve persons. Farther on the old palace adjoins the Castel Nuovo, a massive and extensive castle, with towers and a ditch around, begun in the thirteenth century, by Charles of Anjou, and successively increased. Fronting the castle is the finest square in Naples, called Largo del Castello. East of Castel Nuovo is the mole, with the lighthouse at the end of it. The harbour, which it is intended to shelter, is small, and not always safe.

The mole affords a promenade, which is much frequented by the citizens, and on which Punch, and a story-teller, who recites the romantic deeds of Rinaldo, are generally stationed in the afternoon.

2. The palace, museum, and library, called 'degli Studj,' are in the northern part of the town, at the foot of the hill of Capodimonte. The museum, styled 'Museo Borbonico,' is one of the richest in Europe. Among the numerous masterpieces of antient sculpture which it contains, the Hercules Farnese, the Venus Callipyge, the Apollo Citharoedus, the Bacchus, and the statue of an orator called Aristides [ARISTIDES], deserve especial mention. The museum is also rich in antient bronzes; the Mercury, the Satyrs, a horse's head, &c. are much admired. The collection of antient instruments, utensils, female ornaments, and other household articles found at Herculaneum and Pompeii, is unique. It contains also a vast number of articles of glass, mostly Egyptian. The collection of Campanian, Greek, and Sicilian vases, as well as the numismatic cabinet, is also very rich. That of antient paintings is very remarkable, although most of them are evidently the work of second-rate artists. There are also some fine antient mosaics. The tables found at Heraclea, in Magna Græcia, are valuable as specimens of Greek palæography. A good description of the museum, with plates, has been recently published by the government, 'Il Reale Museo Borbonico,' 16 vols. 4to.

The Gallery of Modern Paintings contains many good works of the Neapolitan, Flemish, Venetian, and Bolognese schools. The collection of papyri found at Herculaneum has hitherto disclosed few works of any importance. [HERCULANEUM.] The Royal Library contains 150,000 printed volumes, and about 3000 MSS. A catalogue of it was published in 1830, in 2 vols. fol. Besides this library, which is open to the public, there are two or three other public libraries at Naples, such as that of S. Angelo à Nido, and that of the convent of S. Filippo Neri.

3. The churches of Naples amount to about two hundred; but in general they are remarkable for their monuments, paintings, and other accessories, rather than for their architecture. The cathedral, begun by Masuccio, a Neapolitan architect and sculptor of the thirteenth century, has been since repeatedly altered, ornamented, and spoiled. The interior is rich in antient columns of valuable marbles; it also contains a splendid mausoleum of Charles I. of Anjou, the conqueror of Naples. The adjoining chapel of San Gennaro is rich in paintings: the ceremony of the liquefaction of the blood of St. Januarius continues to be performed there annually. Valéry, in his 'Voyages Historiques et Littéraires en Italie,' has described it as he saw it in September, 1826. The front of the church of S. Paolo, built on the site of a temple of Castor and Pollux, contains some fluted columns of marble, the remains of the antient structure.

The church of San Lorenzo, founded by Charles of Anjou, on the site of the town-house, where the municipal council of the city formerly used to assemble, contains several royal tombs and some good paintings. The church of S. Filippo Neri is built in better taste than most of the churches of Naples; it is rich in paintings, and contains the tomb of Vico, an original Neapolitan thinker and writer in the early part of the eighteenth century. The church sacristy and convent of S. Domenico constitute a real museum of the middle ages, on account of the numerous monuments of kings, literary men, and other distinguished personages of the times of the Anjous and Aragonese; and for the cell, lecture-room, and chair of Thomas Aquinas, who resided, wrote, and taught in this convent. The interior of Santa Chiara is elegant and rich: it contains the monuments of Robert of Anjou, the friend of Petrarch; of his son, the duke of Calabria; of Joanna I.; and of Raimondo Capanno, a Moorish slave, who became great seneschal of the kingdom, and acted a part in the murder of Joanna's husband, Andreas of Hungary. The neighbouring church of Gesú Nuovo, the façade of which has been compared to that of a prison, has in the interior the appearance of a splendid ball-room. It now belongs to the Jesuits, who were re-established at Naples in 1818. The church of Monte Oliveto is rich in sculptures by Giovanni di Nola, Donatello, Benedetto da Majano, and other celebrated artists. The vast adjoining convent, which once afforded an asylum to Tasso, has been suppressed, and is now occupied by several offices of the municipal administration. San Giacomo dei Spagnoli contains the magnificent tomb of Don Pedro de Toledo, one of the best Spanish viceroys of Naples. The small neglected church of S. Giovanni à Carbonara is remarkable for the monuments of King Ladislaus and his sister Joanna II.; and in the chapel behind the altar, that of her favourite,

Ser Gianni Caracciolo, who was murdered at last through a court intrigue. The walls of this chapel are painted with frescoes, now much impaired and defaced, which have reference to the history of Joanna and Caracciolo. The convent of San Giovanni had once a library rich in MSS., founded by Parrhasius and Cardinal Seripandi; but about a century since, the emperor Charles VI. having sent some learned Germans to examine the MSS. and make extracts from them, the monks felt so wearied by their obligatory attendance on the foreign scholars, that they preferred making an offer of the MSS. in question to the emperor, in order to avoid being exposed to any further trouble about them. (Valéry.) The church Del Carmine, with its lofty steeple, is chiefly noticed for its neighbourhood to the great market, the scene of Masaniello's insurrection, and also of the desperate defence of the populace against the French in 1799; and likewise for the modest tomb of the unfortunate Corradino and his cousin Frederic of Austria, who were beheaded near this spot by order of Charles of Anjou. The church of L'Annunziata, by the architect Vanvitelli, is one of the best churches of Naples: adjoining to it is a foundling hospital and a Magdalen. The church of San Martino, near the castle of Sant' Elmo, from which there is a most magnificent view of Naples and the bay, is richly painted by Lanfranco, Spagnoletto, and D'Arpino: the adjoining convent is now occupied by invalids from the army, of whom many are blind. The church of Santa Maria del Parto, founded by Sannazaro, in a delightful spot, near the shore of Mergellina, has a fine mausoleum of the poet. San Gennaro dei Poveri is remarkable for its vast catacombs, which extend under the hill of Capodimonte.

4. The royal palace of Capodimonte is a heavy structure, but is remarkable for its fine situation, the excellent road leading to it, constructed by the French, its extensive park and hunting grounds, and the adjoining observatory. On the slope of the hill is the Chinese College, for the education of young Chinese, who, after taking holy orders, return to their country as missionaries. The number of Chinese students seldom exceeds six. An account of this remarkable institution is given in 'Italy and the Italians in the Nineteenth Century,' by A. Vieusseux, which work contains also many particulars concerning the peculiar sights of Naples and the manners and habits of the people.

On another part of the hill of Capodimonte is the botanical garden, formed in 1818, and placed under the direction of the Neapolitan professor of botany, M. Tenore. Not far from thence, in a secluded valley at the foot of the hill, are the remains of an aqueduct constructed by Augustus, which is called Ponti Rossi, 'red bridges or arches,' from the colour of the stone.

Naples has many charitable institutions, such as the great hospital Degli Incurabili, the foundling hospital already mentioned, the school of the deaf and dumb, the asylum for the blind, under the direction of the distinguished oculist Quadri; the Reclusorio, or general workhouse for able-bodied poor, with a school annexed to it, and which contains about 3000 poor; San Gennaro dei Poveri, for the poor who are unable to work, San Francesco di Sales, and several other minor hospitals and houses of refuge. Valéry seems to think that the administration of the workhouse might be susceptible of much improvement, especially with regard to moral discipline. Mendicity is forbidden by law; but the law is often evaded. There are no poors'-rates at Naples.

The university is well provided with professors. It has a good library and a cabinet of natural history annexed to it. Some account of the state of education in the Neapolitan kingdom is given in Nos. 5 and 16 of the 'Quarterly Journal of Education.' Among the special schools are a medical college, a veterinary college, two military schools, a college of pilots, and the 'Conservatorio,' or school of music, which has produced many illustrious composers, has some good professors, and a rich musical library, containing among others the autographs of Paisiello's works. Besides San Carlo, Naples has half a dozen minor theatres, Il Fondo, i Fiorentini, Teatro Nuovo, La Fenice, San Carlino, &c. In the last two, plays, or rather farces, are performed in the Neapolitan dialect, which is full of humour and naïve expression.

The Neapolitan or Apulian dialect is very old; it was spoken at the court of Frederic II. and his son Manfred, and their contemporary, the chronicler Matteo Spinello, wrote in it the annals of those two princes. The popular songs or ballads, of which every now and then new ones are produced by obscure poets and sung about the streets, generally run upon love matters, which furnish the principal incidents in the existence of the people of this country. Some of these songs are full of pathos. The following are specimens:—

'Albero piccirillo te chiantaje;
Io t' adacquaje col li miei sudore;
Venne lo viento, e ne rompe no ramo;
La fronna verde ha cagnato colore;
Lo frutto doce è diventato amaro;
Addò è ghiuto lo bello sapore?
Viene, morte, arremedia a chiste guaje,
Giacchè nennillo mio ha cagnato amore.'

('I planted a small tree, and watered it with the sweat of my brow; but the wind came and broke a branch of it, the green leaf became withered, and the fruit, once sweet, grew bitter: Oh, where is its sweet flavour gone? Come, O death, and put an end to my distress, since my love has left me for another.')

We extract the next, which is conceived in a wilder spirit, from Valéry, who heard it about the streets of Naples in 1826-27:—

'Che bella cosa è de morire acciso
Nnanze a la porta de la nnammorata,
L'anema se ne saglie in paradiso
E lo cuorpo lo chiagne la scasata.'

('A desirable fate, to be stabbed to death at the door of one's love! The soul then ascends to paradise, while the forlorn beauty bathes the bleeding body with her tears.')

For a further account of the Neapolitan dialect, see Italy—*Italian Language and Literature*, and the references in that article.

The population of Naples, which in 1835 amounted to about 350,000, was reduced by the cholera in the two following years to 336,300, according to the returns of the end of 1837, exclusive of the garrison and non-resident foreigners. (*Bollettino Statistico di Milano*, January, 1839.) Of this population, about 1700 are priests, 700 monks, and 800 nuns; 9400 are employed under the government, and 18,000 are pensioners, 3000 lawyers, 26,000 are men-servants, 3400 coachmen, 8000 sailors, boatmen, and fishermen, 3500 porters, 5200 shop-boys, 3700 gardeners and greengrocers, 2500 tailors, 2400 shoemakers, 800 cobblers, 1450 barbers and hairdressers, 1500 cooks, 500 printers, 59 booksellers, 58 bookbinders, 146 physicians, 105 surgeons, and 186 apothecaries, 900 sellers of wine, 303 coffee-house-keepers, 350 tavern and eating-house keepers, 310 innkeepers, 800 fruiterers, 800 goldsmiths, 1000 smiths, 2400 carpenters, 1600 builders and masons, &c. Naples has manufactures of hats, straw-hats, gloves, leather, earthenware, coral, and jewellery. There are about 700 hackney-coaches, 600 cabriolets, 1600 boats, and about 500 vessels, belonging to the town of Naples. There are 809 inns and lodging-houses. The town is divided into twelve 'quartieri,' or districts, of which five and the most populous are in the old or eastern part of the town, namely, Mercato, Pendino, Porto, S. Lorenzo, and Vicaria; one in the middle, S. Ferdinando, in the neighbourhood of the royal palace; two at the west end, Chiaja and S. Giuseppe; one, S. Carlo all' Arena, at the north end towards the road to Rome; and three, Stella, Avvocata, and Monte Calvario, include the upper part of the town, which is built on the hills of Capodimonte and S. Elmo. Every district has a commissary of police, whose office is open at all hours of the day. There are sixty-six military posts in the whole town, four castles, S. Elmo, Castel Nuovo, Castel dell' Uovo, and Castello del Carmine, besides extensive barracks both for infantry and cavalry. The town has six prisons, one of which is for debtors. The vast and massive structure called 'La Vicaria,' at the east end of Naples near Porta Capuana, which was once a castle and the residence of the Norman kings, now contains various courts of justice, and also the archives of the kingdom, an immense collection of documents, divided into four sections, historical, financial, judicial, and communal. The acts, edicts, &c. of the sovereigns of the Anjou dynasty alone fill 360 thick folio volumes. The 'Constitutiones' of Frederic II., the oldest code of the kingdom, written by his chancellor Pietro delle Vigne, are also there.

The Lazzaroni, so often mentioned by travellers, and so confusedly described, included the lowest orders of the inhabitants or populace, the porters, the hawkers of fish, vegetables, and other eatables, the boatmen, journeymen out of place, and numerous vagrants, and other low and loose characters. Many of these classes in former times had no regular domicile, and lived chiefly in the open air, or were huddled together at night under some porch or

vestibule, in narrow alleys, in their boats, and wherever they could find shelter. To these were added indiscriminately the numerous class of fishermen, an industrious race, whose habits have always been more domestic and orderly than those of the common lazzaroni. All these people were vaguely reckoned, with probably some exaggeration, at 40,000 individuals, a muscular, brawny, and erect set of men, but totally uneducated and little civilised, very abstemious and frugal in their habits, mostly barefooted, living from day to day on their casual earnings, their dress consisting merely of a shirt and a pair of loose trowsers; very good-tempered in quiet times, but apt to run riot on the first political excitement or tumult. The name lazzaro is said to have been derived from the numerous lepers who once abounded on the coasts of the Mediterranean, and who invoked as their patron the Lazarus who is mentioned in the Gospel. A charitable order, or fraternity, which was instituted in the middle ages for their relief, assumed the name of 'Order of St. Lazarus.' The lepers were obliged to wear a peculiar dress, consisting of white shirt and trowsers and hood. After the leprosy became extinct, the same garb continued to be worn by the lower orders for the sake of cheapness and convenience in the warm climate of Naples, and the name lazzari was retained and applied to that class. This is the etymology given by Galiani and others, in the 'Vocabolario del Dialetto Napolitano,' published at Naples in 1789. But the author adds that already in his time the number of the lazzari had much decreased, owing to the progress of civilization, and that 'many among the people who had the appearance of lazzari during the week-days, looked very different when dressed in their Sunday clothes.' As a peculiar class, the lazzari may be said to be now extinct: the lower orders live like those of other cities; they are all duly registered in their respective parishes, they have all a domicile of some sort, and the police regulations, enforced for the last thirty years, have produced a material alteration in their habits, though the every-day clothing of many of them continues to be the same as before.

The nobility at Naples are very numerous, but, excepting their titles, they enjoy no privilege or influence above the rest of their countrymen. The alterations made in the law of inheritance, by which all the children succeed in equal or nearly equal portions, as in France, have broken down the fortunes of most families, which were already encumbered by debts, the consequence of want of order, of indolence, and expensive habits of living. The most important and interesting class at Naples at present consists of the higher ranks of the middle orders, including lawyers, physicians, professors, and men of other liberal professions, some native merchants, the higher officers under government, and the better sort of the clergy. Among these are found considerable information, much civility united to frankness, great sociability, and respect for decency and morality. Those who wish to know more particularly the present state of Neapolitan society and the changes which it has undergone during the last half century, may consult Colletta, *Storia del Reame di Napoli*, a work of great moral penetration, extensive observation, and written with remarkable impartiality.

The palaces of the nobility are spacious and massive, but few of them are in a good architectural style. The most remarkable are the palazzo Gravina or Orsini, the palace Maddaloni, that of Sansevero, remarkable for its chapel, adorned with some good statues, that of Della Rocca, those of Francavilla, Stigliano, Berio, &c. The building which has been raised between the streets Toledo and S. Giacomo, for the offices of the financial department and for the bank of the Two Sicilies, is one of the finest structures in Naples.

Naples is not so well supplied with water as Rome, and has not such handsome fountains; those of Fontana Medina and Monte Oliveto are the best. Several aqueducts from the neighbouring mountains supply the water, besides which most houses have cisterns. There is a sulphureous spring of water on the shore of Santa Lucia, which is much drunk by the inhabitants in the spring.

The neighbourhood of Naples abounds in delightful walks. The public gardens, or 'Villa Reale,' extending along the shore of Chiaja for nearly a mile, enjoy the advantages of the sea-breeze, and of a view unrivalled in the world. The new road over the hill of Posilipo is a beautiful drive. The hills of Capodimonte and Scutillo, and the suburbs of Infrascata and Arenella, at the back of Sant' Elmo, abound with pleasant walks and a variety of scenery. These, as well as the other neighbouring hills of Vomero, Posilipo, &c., are covered with country-houses and gardens of all sizes. But the hills are mostly destitute of trees, and appear barren and parched, especially in summer.

Naples is an archbishop's see, and is divided into fifty parishes, including the neighbouring villages.

The town is abundantly supplied with provisions of every kind; fish and shell-fish are plentiful, as well as vegetables and fruits. Snow, of which a great quantity is used, especially in summer, for cooling the drink and for ices, is brought from the mountain of Castellamare, where it is kept in large reservoirs.

The great street of Toledo is thronged with people and carriages at all times of the day, and until very late at night, or rather until two or three o'clock in the morning, when fashionable people retire to rest. It is decidedly the noisiest street in Europe, as the people are in the habit of vociferating at the top of their voice; and others must do the same in order to be heard. The motley groups which are seen mixing pell-mell in the street, the crowded balconies above, the numerous venders of provisions, the acquaiuoli, or sellers of ice-water, at the corners of the bye-streets, the life out of doors, which is a general habit in this country, all render the streets of Naples, and especially that of Toledo, most curious to a foreigner.

Naples, or Neapolis, that is, 'New City,' was a Greek colony from Cumæ; the date of its origin is not known. The story of its first foundation, under the name of Parthenope, is a mythic tradition. Livy (b. viii. 22) says that there were once two towns near each other, Palæopolis and Neapolis, the inhabitants of both being from Cumæ, but Palæopolis had, long before Livy's time, merged into the new town, or Neapolis.

Neapolis, after its first foundation by the Cumæans, received colonists from Chalcis, Pithecusa, and Athens; and subsequently admitted some Campanians also among the body of citizens. (Strabo, p. 246. *Casaub.*) It became allied to the Samnites, but after their subjugation by Rome it maintained its independence as a republic, and during the second Punic war sent ambassadors to Rome to propose an alliance against Hannibal, and with it a rich present in golden vases, which the people took from their temples to defray the expenses of the war. (Livy, xxii. 32.) It continued afterwards an ally to Rome and became a municipium. After the fall of the empire Neapolis was taken by the Goths, retaken by Belisarius, and lastly destroyed by Totila, A.D. 543. It was afterwards rebuilt, and annexed to the Longobard duchy of Beneventum, but after the decline of the Longobard power, when the Byzantine emperors asserted a kind of supremacy over southern Italy, Naples had its dukes, who were chosen by the inhabitants. In the ninth century the dukes of Beneventum obliged it to pay tribute. When the duchy of Beneventum was split into three principalities, Benevento, Capua, and Salerno, Landulf, count of Capua, in order to maintain its independence of the other two, called in the Saracens, who devastated the shores of Campania. The Norman adventurers lent their assistance to the prince of Salerno against these piratical hordes, and afterwards by degrees established their own power in Apulia and Sicily. Naples was one of the last towns which submitted to the Normans; it acknowledged king Roger I., of Sicily, as its sovereign, about A.D. 1137. The subsequent history of Naples, both political and literary, is given under the head of SICILIES, TWO, KINGDOM OF THE.

The following are the principal works concerning the town of Naples, besides those which have been mentioned in this article:—Celano, *Notizie del bello, dell' antico, e del curioso della Città di Napoli*, 4 vols. 8vo., 1792; Romanelli, *Napoli antica e moderna*, 3 vols. 8vo., 1815; Vargas, *Ragguagli storici dell' Origine di Napoli*, 4to., 1754; and also *Dissertazioni istorico-legali sull' Antichità, Sito, ed Ampiezza della Liburia Ducale, o siasi dell' Agro e Territorio di Napoli*, 4to., 1756, by the same; Giraffi, *Le Rivoluzioni di Napoli*, 8vo., 1647; Chioccarelli, *Antistitum Neapolitanæ Ecclesiæ Catalogus ab Apostolorum temporibus ad annum 1643*, fol.; Stefano (Pietro di), *Descrizione dei Luoghi Sacri di Napoli*, 4to, 1560; Caracciolo (Eugenio), *Napoli Sacra*, 4to., 1623; Lasena (Pietro), *Dell' antico Ginnasio Napolitano*, 4to., 1641, 1688; Origlia, *Istoria dello Studio di Napoli*, 2 vols. 4to. 1754; Signorelli, *Storia della Reale Accademia delle Scienze e Belle Lettere à Napoli*, 1787; Attumonelli, *Delle Acque Minerali di Napoli*, 8vo., 1808; Ricci, *Analisi chimica dell' Acqua Ferrata e Sulfurea di Napoli*

8vo., 1821; Vetrano, *Sebethi Vindiciæ, sive Dissertatio de Sebethi antiquitate nomine, &c.*, 8vo. 1767.





Coin of Naples.
British Museum. Actual Size. Silver.

NAPOLEON. [BONAPARTE.]

NAPOLEON, CODE. [CODES, LES CINQ.]

NA'POLI DI MALVASI'A, or MONEMBASIA, a town built on an island on the east coast of Laconia, and connected with the mainland by a bridge about 540 feet in length. Its situation gave rise to its name Monembasia (single entrance). About four miles north of the bridge, along the coast of the mainland, are some ruins which Leake considers to be those of Epidaurus Limera, while Monembasia is the Minoa of Pausanias, which was a small place in his time. As Epidaurus fell into decay, the town on the island grew into importance, and it then probably assumed the name of Neapolis, or new town, in addition to that of Monembasia. It was a place of some consequence under the Byzantine emperors, and Andronicus Comnenus in the twelfth century founded here a monastery, which still exists, and the church of which is one of the largest in Greece. The Franks when they conquered a great part of the empire in the thirteenth century corrupted the name of Monembasia into that of Malvasia. The country in the neighbouring district formerly produced a luscious wine, to which the Venetians gave the name of Malvasia from the town at which it was shipped, and the name has been since applied as a generic appellation to wine of the same quality made in other parts of the Mediterranean, as at Lipari, in Sardinia, Spain, &c. This is the kind of wine called in English *malmsey*.

The island of Monembasia is hilly, about half a mile in length, and one third of a mile in breadth. The castle is on the summit of the hill, and the town, which is built below it, extends to the sea on the south side of the island. The streets are narrow and steep; the place contains about 300 houses, besides 50 more in the castle. The ramparts and several other buildings were constructed by the Venetians, who took possession of the place in the thirteenth century and kept it till 1540, when it was given up to the Turks by a treaty. On this occasion most of the inhabitants left it along with the Venetian garrison and found an asylum in the other Venetian possessions. It now forms part of the new kingdom of Greece.

The bishop of Monembasia, a metropolitan of high rank in the Greek church, has seven suffragan bishops under him, including those of the neighbouring district of Maina. (Coronelli; Leake.)

NA'POLI DI ROMANI'A, NAU'PLIA, ANAPLI', a town of the Morea, built on a rocky promontory at the north-east extremity of the Argolic Gulf. The harbour between this promontory and the north coast is large and tolerably safe, but has become too shallow to admit large ships. A small fortified island lies at the entrance of the harbour. The town stands on the north-east slope of the hill facing the mainland, and is fortified; the hill has a tabular summit, which is unoccupied with houses, and from which abrupt cliffs descend to the open sea at the back of the promontory. A steep and rocky mountain rises above it to the south-east called Palamedi, a very antient appellation derived from Palamedes, the son of Nauplias, the reputed son of Neptune and founder of the town. On this cliff is the castle, which is very strong owing to its almost inaccessible situation.

Nauplia was once the port and arsenal of Argos, but in the time of Pausanias it was deserted. It revived under the Byzantine emperors, was occupied by the Venetians in the thirteenth century, and became their chief settlement in the Morea, until it was taken from them by Sultan Solyman in 1537. The fortifications are of Venetian construction, but the ramparts towards the east are partly composed of the antient walls of the town, which are of a similar construction with and probably of the same date as those of the Acropolis of Argos. Other and later remains of Hellenic construction are seen on the brow of the tabular summit above the town.

Nauplia, after the Greek insurrection, remained for several years the head town of Greece, until it was superseded by Athens. Its population, which had risen to about 12,000 inhabitants, has recently declined. The streets are irregular and dirty, and the air is not wholesome. A few of the houses and the barracks are of a superior description to the rest of the buildings. The bishop, of the Eastern communion, is styled bishop of Argos and Anapli. There is also a Latin church. An aqueduct of good water from the rocky ridge near Tiryns supplies the town. (Spon; Coronelli; Leake; Gell.) From the old Greek name of Nauplia the Franks made by corruption that of Napoli, to which they added 'Di Romania' to distinguish it from the Italian Napoli.

NARBONNE, a city in France, in the department of Aude, near the coast of the Mediterranean, in 43° 11 N. lat. and 3° 0' E. long., 539 miles from Paris by Orléans, Châteauroux, Limoges, Cahors, Montauban, and Toulouse.

Narbonne (the Roman Narbo, or Narbo Martius) is one of the oldest cities of France. A Roman colony was planted here about B.C. 116, and it had been one of the chief towns of the Volcæ Arecomici, a Celtic people, long before that time. Cæsar sent additional colonists to Narbonne, the veterans of the tenth legion. Cicero (*Pro Fonteio*, c. i.) speaks of Narbo as 'a watch-tower and bulwark of Rome.' Mela (ii. 7) speaks of Narbo as being in his time the chief town of that province of Gaul, in which it was situated, and to which it gave the title of Gallia Narbonensis. Strabo (p. 101. *Casaub.*), describes it as the emporium of all Gaul; and, at a later period, Sidonius Apollinaris and Ausonius have borne testimony to the number of its structures or the extent of its wealth. The course of the Atax, or Aude, through the adjacent lake of Rubresus, or Rubrensis (étang de Sigean), was facilitated by an artificial channel 100 feet wide and 30 feet deep; and the navigation of the river, though of small extent, promoted the commerce of the town. The history of Narbonne under the Romans has been minutely given by Expilly, in his 'Dictionnaire des Gaules,' &c.

In A.D. 413, Ataulphus, king of the Visigoths, surprised Narbonne, where he shortly after celebrated his marriage with Placidia, sister of Honorius. He was however soon obliged to abandon the city; but in A.D. 462 the Visigoths obtained possession again by treachery, and retained it. After the taking of Toulouse by Clovis and the Franks, Narbonne became the Visigothic capital: it was repeatedly taken by Franks and Burgundians, and early in the eighth century fell into the hands of the Saracens [MOORS, p. 385], from whom it was taken (A.D. 759) by Pepin le Bref, and annexed to the Frankish monarchy. Narbonne was subsequently pillaged by the Northmen. In the ninth and tenth centuries it was the capital of the marquisate of Gothia, or Septimania, which was afterwards merged in the county of Toulouse. Under the marquises of Septimania, Narbonne was governed by vidames, or viscounts, who were at first removable, but afterwards became hereditary, and were feudatories of the counts of Toulouse and (for a portion of the town) of the archbishops of Narbonne. Aymeri III., viscount of Narbonne, was engaged in the crusade against the Albigenses: the Inquisition was established at Narbonne in his time, but not without occasioning considerable disturbances. The inhabitants were at this time extensively engaged in commerce, and had alliances and treaties with Marseille, Nice, Genoa, Pisa, and other trading towns on the Mediterranean. In 1348 the plague carried off 30,000 of the inhabitants of Narbonne, a loss which attests the greatness of the population. In 1355 Aymeri IX., viscount of Narbonne, defended the place successfully against the attacks of the Black Prince, but was taken prisoner next year at the battle of Maupertuis, or Poitiers. In 1407 Guillaume, or William II., viscount of Narbonne, contested the possession of Sardinia (whither he had been invited by the natives) with the kings of Sicily; he was ultimately however obliged to yield. He was one of the supporters of the Dauphin, afterwards Charles VII.; and took part in the murder of Jean, duke of Bourgogne, at Montereau (A.D. 1419). He fell (A.D. 1424) in the battle of Verneuil against the English. The viscounty afterwards passed by sale to the counts of Foix. The last viscount was Gaston de Foix, nephew of Louis XII., king of France, who fell in the battle of Ra-

venna (A.D. 1512). He had before his death exchanged his viscounty, which was annexed to the crown, for the duchy of Nemours. In the religious wars of the sixteenth century, Narbonne embraced the party of the League; but in 1596 the inhabitants submitted to Henri IV.

There do not appear to be at Narbonne any edifices of Roman erection; but a number of fragments of Roman architecture are incorporated in the walls of the town, which were erected in the reign of François I.; and a number of inscriptions exist in excellent preservation. A few years ago, many thousand silver coins of the Roman emperors were found at Narbonne.

The town is situated upon the Canal Robine de Narbonne, by which a portion of the waters of the Aude flow into the Mediterranean. It is a fortress, but not of the first class, surrounded by an old wall, with several bastions and towers. The Canal Robine divides it into two parts, respectively distinguished as Le Bourg and La Ville, between which there is communication by three bridges. Along the bank of the canal is a public walk planted with trees. There are a cathedral and two other churches. The cathedral is a Gothic building, with a fine nave. It contains the mouldering tomb of Philippe III., le Hardi, king of France. The archbishop's palace is an antient building, having much the appearance of a fortress, and is defended by square towers. There are barracks, an arsenal, a military hospital, two other hospitals, and a prison. The population, in 1826, was 10,097 for the commune; in 1831 it was 9281 for the town, or 10,246 for the whole commune; in 1836 it was 10,792 for the commune, showing a steady but not rapid increase. The country about Narbonne is fertile in corn, but the neighbouring marshes render the place unhealthy. The inhabitants make brandy and other distilled spirits, verdigris, bricks, tiles, pottery, and paper, and are engaged in throwing silk, dyeing, and tanning. They carry on trade in corn, red and white wine, brandy, oil, salt, soda, wax, and excellent honey, which is collected in the arrondissement. There are two yearly fairs. There are marble quarries and salterns near the town. There are several fiscal government offices, an Exchange, a subordinate court of justice, and a commercial court; a society of agriculture, a society of emulation, a school of hydrography, and a seminary for the priesthood; a museum, a theatre, and public baths. The village of La Nouvelle, at the mouth of the Canal Robine, is the port of Narbonne. The learned Benedictine Montfaucon was a native of Narbonne.

The archbishopric of Narbonne is very antient: the foundation of the see has been carried by some as far back as the first century of the Christian æra. It is now united to the archbishopric of Toulouse.

The arrondissement of Narbonne has an area of 581 square miles, and comprehends seventy communes. It is divided into six cantons or divisions, each under a justice of the peace. The population, in 1831, was 54,101; in 1836 it was 56,965.

NARBOROUGH, SIR JOHN, an English naval commander of some distinction, was descended from an old family in Norfolk, and received his first commission, as lieutenant of the Portland, in the year 1664. In the ensuing Dutch war, his bravery and good services soon became so conspicuous that, within two years, after the long and desperate action, in June, 1666, between the English fleet, under Prince Rupert, and Monk, duke of Albemarle, and the Dutch under De Ruyter and Van Tromp, he was promoted to the command of the Assurance, a fourth rate. After the conclusion of peace, he was selected to conduct a voyage of discovery to the South Seas, for which destination he sailed 1669, in the Sweepstakes, of 36 guns, attended by the Bachelor pink. In the following year, he passed the Strait of Magalhaens; and, after being impeded, in the ports of the Pacific, by the jealousy of the Spanish authorities, with the usual obstacles to either intercourse or research, from which he extricated himself with remarkable prudence, he returned home in 1671. Captain Philip Parker King, in speaking of the early navigators who explored the Strait of Magalhaens, observes that "among the numerous plans of it that are extant, those of Sir John Narborough and Cordova are the most correct."

On the breaking out of the second Dutch war, in 1672, he was taken by the lord-high-admiral, the duke of York, into his own ship, the Prince, as second captain; and in the obstinately contested battle of Solebay with the Dutch fleet under De Ruyter, in which the first captain of the Prince, Sir John Cox, was killed, and the vessel so disabled that the Duke of York was compelled to shift his flag into the St. Michael, Narborough's energy and ability in refitting the ship for action in a few hours, as well as his courage during the fight, were deemed sufficiently meritorious to be made the subject of special commendation in the account of the action published by authority of government. After being, next, successfully employed in convoys and other duties, he was raised, in 1673, to the rank of rear-admiral, and received the honour of knighthood. In 1674 he was appointed commander-in-chief of a fleet sent to the Mediterranean, for the purpose of overawing the Tripolines and other piratical states, and obtaining redress for their depredations upon the national commerce; and he acquitted himself with so much spirit, address, and success in this duty, that he compelled the Bey of Tripoli to release all his British captives, to pay 80,000 dollars in reparation for injuries to the British trade, and to grant to British subjects more honourable and valuable privileges than any other nation had before possessed or claimed. Having achieved these objects, Sir John Narborough returned to England with his squadron in 1677: but the skill and gallantry with which he had fulfilled his instructions caused him, almost immediately, to be despatched again to the Mediterranean, in command of another fleet, with a similar commission to chastise the piracies of the Algerines. In this expedition he acted with his accustomed vigour; burnt or sunk many Algerine vessels of war; cannonaded the city of Algiers itself with good effect, though without being able to bring the pirates to terms; and concluded his operations by capturing and carrying into Cadiz a whole squadron of five Algerine frigates, which the Dey had equipped to obtain satisfaction for his previous losses. This exploit, after which he returned home in 1679, was Sir John Narborough's last important service at sea; but in the following year he was made a commissioner of the navy, and continued to hold that office both during the remainder of the reign of Charles II., and throughout the whole of that of his patron James II., until his death, which occurred towards the close of 1688. (Charnock, *Biographia Navalis;* Captain P. P. King, in the *London Geographical Journal*, vol. i.; and Sir John Narborough's *Journal*.)

NARCEIA, an alkali procured from opium by Pelletier in 1832. To prepare this substance opium is to be digested in repeated portions of cold water until the soluble part is dissolved. The mixed solutions are to be evaporated to the consistence of an extract, and when this is treated with boiling water, a brilliant crystalline substance is left, which is the narcotina of the opium; this is to be separated. The clear liquid is then to be heated to ebullition, and ammonia added slightly in excess to precipitate the morphia; expel the excess of ammonia by heat; the liquor being then evaporated to one half, more morphia is separated, and barytes water mixed with it throws down meconate of barytes; carbonate of ammonia then added precipitates the excess of barytes, and heat expels the superabundant ammoniacal salt. The liquor being again filtered, evaporated to the consistence of a thick syrup, and set aside in a cool place for some days, yields a pulpy mass which contains crystals; this is to be drained, dried by strong pressure, and digested in boiling alcohol; the solution obtained, when the spirit is distilled, yields a crystalline substance, which, when repeatedly dissolved and crystallized, is narceia in a state of purity.

The properties of narceia are, that it crystallizes in colourless acicular four-sided prisms, is inodorous, has a slightly bitter taste, dissolves in 375 times its weight of cold and 230 times its weight of boiling water; alcohol dissolves it, but æther does not. At about 198° it melts, and on cooling it concretes into a white translucent mass, exhibiting appearances of crystallization. At 230° it becomes yellow, and at a higher temperature it is decomposed.

Dilute acids combine with narceia, but they continue to redden vegetable blues; when hydrochloric acid diluted with one-third of its weight of water is put into contact with narceia, it becomes of a fine blue colour; but the addition of more water renders it colourless; it may be precipitated from the blue solution by an alkali with its properties unchanged. The stronger and concentrated acids decompose narceia; the persalts of iron are not rendered blue by this alkali. According to Pelletier's analysis, narceia consists of—

Hydrogen	6·52	or nearly	20 equivalents.
Carbon	54·73	„	32 equivalents.
Oxygen	34·42	„	16 equivalents.
Azote	4·33	„	1 equivalent.
	100·		

NARCISSUS is a genus of Endogens belonging to the natural order Amaryllidaceæ, among which it is known by its flowers growing upon a scape, and having a cup at their mouth; the stamens which are opposite the sepals being longer than the others. It consists of bulbous plants principally inhabiting the warmer parts of Europe, only one species, *N. pseudo-narcissus*, or the Common Daffodil, being found plentifully so far north as Great Britain, with two others, *N. biflorus* and *poeticus*, in an apparently wild state, and a very few advancing into Africa.

The species are numerous, and from their hardiness or gay colours, or sweet smell, have long been favourite objects of cultivation, especially the Daffodils, Jonquils, and Tazzettas. A very full account of them will be found in the 'Amaryllidaceæ' of the Honourable and Reverend William Herbert, p. 292 (8vo., London, 1837), who however divides the genus into six others, after the example of Salisbury and Haworth; but as those genera are not likely to be adopted by botanists, with the exception perhaps of the genus Corbularia, no account need be given of them. With regard to Corbularia, to which the name of Hoop-petticoat Narcissus is given, and of which five supposed species are enumerated, the peculiar form of the flower and the delicate stamens of that plant may perhaps entitle it to be regarded as a peculiar genus: the species are pretty, all yellow flowered, with the single exception of *C. cantabrica*, a little plant with white flowers found on the mountains of Biscay and the Pyrenees, but now lost in our gardens.

NARCOTICS (from the Greek adjective ναρκωτικός, which is from νάρκη, a stiffening, stupor, or insensibility), a class of medicines which may be defined—agents which, in moderate doses, cause a temporary increase of the action of the nervous and also of the vascular system, followed more or less speedily by a marked diminution of this action, terminating generally in sleep. When the dose is large, the excitement is scarcely perceptible; while the diminished power of the nervous system is so manifest, that an appearance of coma or apoplexy is induced. All the agents included in this class are capable of producing a state termed narcosis, or narcotism, which, if not quickly removed by a natural subsiding of their influence, or by artificial means, may terminate in death. Many of them are therefore as familiarly known as poisons as therapeutic agents. It is the consideration of them however in this latter quality which is to be entered on in this place. Their power of inducing sleep has procured for them the name of hypnotics, or soporifics; and the property which many of them possess of alleviating pain, by blunting the sensibility, has obtained for them the appellation of anodynes [ANODYNES], or, from one of the best known among them, simply of opiates.

The most important consideration respecting them is the circumstance of their depressing action being always preceded by a stimulant. This peculiarity renders their employment difficult in some cases and improper in others. 'Narcotics must be distinguished from stimulants on the one hand, and from sedatives on the other; and the distinction is the more necessary, because in nature the narcotic principle is generally combined with one or other of these: hence the contradictory and unsatisfactory reports of the value of different narcotic remedies, and the difficulty experienced in their application by those who do not know the reason why opium suits one case, hyoscyamus another.' (Billing's *First Principles of Medicine*, 3rd edit.) The progress of chemistry, by isolating the various active principles existing in the same natural compound, has lessened the difficulty attendant on their administration; still, as no one can be said to act in a manner precisely similar to another, a correct knowledge of each is desirable in order to ensure the selection of that which is best suited to the case. Diversified as they are in their nature and modes of action, there is this common property, that they all make a direct impression on the extremities of the nerves (to whatever part of the body, with few exceptions, they are applied); but their full and ultimate effects do not take place till they are absorbed, and mingled with the circulating fluid.

A slight glance at their action on the different systems of the body will furnish a useful guide in their administration. A full dose of a narcotic introduced into the stomach will, if that organ be empty, destroy the desire for food, while, if it contain food, the digestive process is suspended or rendered slower. Their frequent or continued use is therefore very injurious to that function, on which all the others depend, viz. nutrition; as is displayed in the persons of opium-eaters of the East. Further, should any considerable irritation or subacute inflammatory condition of the mucous coat of the stomach exist, they cause an aggravation of the febrile symptoms, and either in common or cancerous ulceration of that organ they cause great uneasiness. Though their primary effect on the vascular system be stimulating, and many of them send thereby a large quantity of blood to the brain (probably the source of their soporific property), their secondary effect is depressing; and in this the respiratory organs participate. This is at once a source of utility and of danger, for by moderating the action of the heart and lungs, the respiration is rendered slower, an advantage in most inflammatory complaints; but when pushed too far, the blood is not sufficiently aërated, and partaking too much of the nature of venous blood, it does not prove a sufficient stimulus to the brain and other organs.

Their action upon the secreting system is not very uniform, nor are all writers agreed as to its nature. Opium generally checks most of the secretions, except that of the skin, and causes heat, thirst, and constipation. Hyoscyamus rarely causes any of these states, but on the contrary is rather laxative, and aconite greatly increases the secretion of the bile and also of the skin. Many natural compounds have an acrid principle combined with the narcotic, and hence are termed *narcotico-acrids*, such as aconite, squil, colchicum, hellebore, &c.; these generally augment the mucous and other secretions, though they produce narcotism in excessive doses.

Lastly, some of them possess greater influence over one set of nerves than the other, and expend their energy on the nerves of motion, or of sensation, according to their nature.

No set of medicines have their action more modified by a variety of circumstances—such as the quantity given, or the frequency of repetition, also the force of habit, climate, or season, but above all by idiosyncrasy. Age also has an important share in determining the amount of action. Children do not in general bear them well, and therefore though they are very subject to convulsive and spasmodic diseases, other means should be employed, especially the removal of the source of irritation, when practicable. The various nostrums recommended for children generally contain some narcotic, and prove a fertile cause of the mortality of early life. [ANTISPASMODICS.] The administration of narcotics requires more knowledge and judgment than that of any other class of remedies, and should only be had recourse to under competent advice.

In case of over-dose or accidental poisoning, the following observations may be useful. The stomach being rendered insensible to the irritation of emetics, these are generally useless, and much valuable time is lost by administering them. Where better means cannot be had, sulphate of zinc (white vitriol) dissolved in water, or a table-spoonful of flour of mustard diffused through a pint of warm water, may be given, accompanied with pressure on the pit of the stomach, and at the same time tickling the throat with a feather. Neither ipecacuan nor tartar emetic should be used; the latter is particularly unfit. [BELLADONNA.] The stomach-pump is the surest means of emptying the stomach, and should be used as soon as possible. If the brain appear much oppressed, the countenance flushed, and the pulse full, *moderate* blood-letting will be serviceable, especially if artificial respiration be subsequently employed. When the water brought up by the stomach-pump is clear and devoid of any smell of the poison, which will prove that all the hurtful material has been evacuated, *then*, and *not till then*, vinegar may be given to the patient, who should also be kept moving about, and not suffered, if possible, to sink into a state of slumber. Coffee is a very useful beverage, and still more a drink made by boiling twelve ounces of vinegar, and pouring it immediately on three ounces of roasted and ground coffee, or by boiling the coffee in the vinegar, straining it, then adding half an ounce of sugar, and giving it in small quantities to the patient every quarter or half hour. This can be prepared while the stomach-pump is being used, and is one of the most efficacious means of counteracting the narcotic principle. Vinegar given while any of the poisonous substance is in the stomach only increases its deleterious property. [ANTIDOTES.] See Pereira's *Materia Medica* for the mode of action of the different narcotic substances, i., p. 66, and Christison *On Poisons*.

NARCOTI'NA, one of the peculiar and alkaline principles of opium which was discovered by Derosne about 1804; its true nature and alkaline properties were however first

ascertained by Robiquet in 1817. Various processes have been proposed for obtaining narcotina; the easiest method is stated to be that of digesting opium in water, filtering the solution, evaporating it to the consistence of an extract, and digesting this in æther, which dissolves the narcotina and some other substances. The æther being distilled off, the residual matter, which has a brown colour and is acid, is to be dissolved in hot water or boiling alcohol; the solution, after decolorizing with animal charcoal, is to be treated with ammonia, which precipitates the narcotina, and if it be not white, it is to be dissolved in hydrochloric acid, again treated with animal charcoal, precipitated by ammonia, washed, and dried; thus obtained, it is in the state of light white flocks, but when dissolved in boiling alcohol or æther it is deposited from them, on cooling, in pearly acicular crystals.

The properties of narcotina are, that it is insoluble in cold and very sparingly soluble in hot water; æther and the fixed oils readily dissolve it; its taste is not bitter; it does not restore the blue colour of reddened litmus, but as it combines readily with dilute acids, and forms salts which are made to crystallize, though with difficulty, it is classed with the alkalis; the hydrochlorate crystallizes in radiating groups; the sulphate does not crystallize, and the acetate is decomposed by heat: these salts have a taste which is more strongly bitter than those of morphia.

Narcotina has been repeatedly analyzed; the results do not exactly agree, but its composition is not far removed from—

Hydrogen . . .	5·32	or 20 equivalents
Carbon . . .	65·27	or 40 equivalents
Oxygen . . .	25·63	or 12 equivalents
Azote	3·78	or 1 equivalent
	100·	

NARCOTINE. [PAPAVER.]

NARDI, JACOPO, born at Florence in 1476, served first in the troops of the republic, and afterwards in a civil capacity. He was sent in 1527 as ambassador to Venice. He died at a very advanced age, after the fall of the republic. He wrote 'Storia della Città di Firenze dell' anno 1494 al 1531,' published at Lyon in France, 4to., 1582: another edition was published at Florence in 1584. Some passages which were expunged in both editions, but especially in that of Florence, on account of the political feelings of the author, are found in the MSS. in the libraries of Strozzi of Florence and Nani of Venice. Nardi was warmly attached to the republican constitution of his country, of which he witnessed and described the overthrow, whilst his contemporary Nerli, who composed a general history of Florence including the same period ('Commentarii dei Fatti Civili occorsi in Firenze dall' anno 1215 all' anno 1537,' fol., Augsburg, 1728), wrote in a manner favourable to the Medici, and accepted office under the grand-duke Cosmo I. The history of Nardi forms a sequel to that of Machiavelli, which ends with the death of Lorenzo the Magnificent in 1492, and the two together form a complete history of the Florentine republic from its rise till the overthrow of its independence.

Nardi wrote also 'Vita di Antonio Giacomini,' 4to., 1597. Giacomini was one of the most distinguished captains of the Florentine republic. He was also the author of an Italian translation of Livy, and a comedy, 'L'Amicizia,' one of the earliest comedies in Italian verse.

NARDUS. [SPIKENARD.]

NARES, JAMES, Mus. Doc., was born at Stanwell in Middlesex, in 1715, and received his musical education first as a chorister in the King's Chapel, under Bernard Gates, and afterwards under the celebrated Dr. Pepusch. At an early age he was chosen organist of the cathedral of York, and in 1756 was appointed organist and composer to George II., on the decease of Dr. Greene; and about the same time the degree of Doctor in Music was conferred on him by the University of Cambridge. In 1757 he succeeded Mr. Gates as master of the children of the Chapels-Royal, which office he held till 1780, when declining health induced him to resign it to his friend Dr. Ayrton, who had been his pupil. He died in 1783, 'regretted,' says his eldest son, the late Archdeacon Nares, 'not only by the family he left, but in a proportionate degree by all related to or connected with him.' Among these were, his younger brother, Sir George Nares, one of the judges of the Court of Common Pleas, and his nephew, the Rev. Edward Nares, D.D., author of the 'Life and Administration of Cecil, lord Burleigh;' also of Sermons and other works.

Dr. Nares published several musical works, the most important of which are: 'Twenty Anthems in Score, composed for the use of the Chapels-Royal,' and now constantly heard in every cathedral in England and Ireland; 'A Collection of Catches, Canons, and Glees,' dedicated to the Earl of Mornington, including the prize-glee, 'To all Lovers of Harmony,' and 'Fear no more the Heat of the Sun;' 'A Treatise on Singing,' with a set of English duets; and 'The Royal Pastoral, a Dramatic Ode.' After his death a second set of anthems, six in number, together with his popular Service, were, as he had directed, published by his son; and though these anthems have not obtained the same celebrity as those in the former set, they are not inferior in merit, and ought to be brought into notice by the influential persons in our choirs.

Of Dr. Nares it is most justly remarked in the *Harmonicon*, that 'his numerous productions for the church are rich in beautiful air as well as in harmony, not elaborate, but of the purest kind; and his judgment in setting our Liturgy has been equalled by few, exceeded by none; for his natural good sense and cultivated understanding led him not only to avoid the errors too apparent in the works of many ecclesiastical composers who preceded him, but also qualified him to become the guide of those who followed and had discernment and wisdom enough to profit by his examples.'

NARNI, a town of the Papal State, in the fine valley of the Nera, an affluent of the Tiber, and in the administrative province of Spoleto e Rieti, is situated on a hill which forms part of the mountains of Sabina, is a bishop's see, and has about 2500 inhabitants. (Calindri, *Saggio Statistico dello Stato Pontificio.*) It is an ill-built old-looking town; but it has several churches and convents, besides the cathedral, and in the neighbourhood are the remains of a very handsome bridge on the Nera, the antient Nar, said to have been built by Augustus. The antient Nequinum, a strong town of the Umbri, which stood on the present site of Narni, being taken by the Romans, 299 B.C., a Latin colony was sent there, which assumed the name of Narnia, from the neighbouring river. (Livy, x. 9, 10.) Narnia was one of the twelve Latin colonies which, after the battle of Cannæ, refused to give any further assistance to Rome. (Livy, xxix. 15.)

NARRAGANSET BAY. [RHODE ISLAND.]

NARROWS, The. [NEW YORK.]

NARSES, the name of a eunuch who became one of the most successful generals of the emperor Justinian I., and rivalled Belisarius in his military triumphs. His origin and parentage are unknown. He was probably by birth an Asiatic, emasculated, and sold, according to the old barbarous custom of that part of the world, and employed in his youth in menial services in the imperial household of Constantinople. His natural abilities and insinuating manners attracted the attention of Justinian, who had certainly the tact of discerning merit in those about him. Justinian employed Narses about his person, and raised him successively to the office of 'cubicularius,' or 'groom of the bedchamber,' and afterwards to that of keeper of the emperor's privy purse. Narses seems to have known and practised the arts of a courtier, but at the same time he was also capable of better things. He was sent on several missions, and at last, in A.D. 538, he was appointed to the command of a body of troops which were sent to Italy to act under Belisarius. [BELISARIUS.] The two generals acted in concert at first, and obliged the Goths to raise the siege of Ariminum; but they soon quarrelled, and Narses, who was supported by a party at the court of Justinian, chose to act for himself: the consequence was, that Belisarius was cramped in his operations, and meanwhile the Goths and Burgundians took and ravaged Milan. (Procopius, *De Bello Gothico*, xi. 21.) In the year 539 Justinian recalled Narses, who resumed his places at the imperial palace. Several years after, Belisarius having been recalled from Italy, the state of that country fell again into utter confusion; the Goths under Totila overran the whole country; and Germanus, a nephew of the emperor, being sent with an army to prevent the total loss of Italy, fell ill in Dalmatia and died. In the year 552, Justinian determined to make a last effort: he appointed Narses commander-in-chief of the Italian expedition, and supplied him plentifully with money, with which he collected a number of auxiliaries, Heruli, Longobardi, Gepidæ, and others, whom he united with the army of Germanus, and assembled them all near Salona. Not having sufficient vessels

to embark his troops, he marched along the shores of the Adriatic, through Dalmatia, Istria, and Venetia, and thus arrived at Ravenna, from whence, after some days' rest, he moved on across the Apennines, and met Totila, who was advancing from Rome, at a place called Tagina, or Tadinæ, where a desperate battle took place, in which the Goths were completely defeated and Totila was killed. Narses advanced to Rome, which he took, whilst the Goths, having retired to Pavia, elected for their king Teias, who moved with a fresh army to encounter Narses. The two armies met on the banks of the river Sarno, near Nocera in Campania: Teias was killed in the fight, and the remaining Goths entered into a convention with Narses, by which they laid down their arms and withdrew to North Italy, where they dispersed in various parts of the country. Not long after however part of them joined a host of Franks and Alemanni who had crossed the Alps, under two brothers, called Lother and Bucelin, and the whole made an irruption into South Italy whilst Narses was besieging Lucca. The barbarian host advanced as far as Calabria, plundering and committing all sorts of excesses; but on returning northwards loaded with booty, they were met by Narses on the banks of the Volturno, and totally destroyed. The Gothic kingdom in Italy was now at an end, and the whole country acknowledged the authority of Justinian, who appointed Narses exarch of Italy, A.D. 553. Narses fixed his residence at Ravenna, as the most convenient place for a prompt communication with Constantinople. During his fifteen years' administration, he did much to re-establish order throughout Italy; he checked the licentiousness of his troops, dismissed the most turbulent of his barbarian auxiliaries, appointed governors, with the title of dukes, to the different provinces, and repressed faction and religious schism. He has been accused of only one vice, avarice: he is charged with accumulating a large treasure during his residence in Italy. After the death of Justinian, A.D. 565, the enemies of Narses obtained his recal from the emperor Justinus II., who sent Longinus to supersede him as exarch of Ravenna. It is said that Sophia, the wife of Justinus, added to the letters of recall an insulting message to the purport that he ought to leave to men the command over other men, and return to the use of the distaff among the women of the palace; to which Narses is said to have retorted, that he would spin her a thread that she should not be able to unravel. He is accused of having entered into a correspondence with Alboin, king of the Longobards, inviting him to invade Italy. This however rests upon dubious report. Narses, after giving up his command, withdrew to Naples, but soon after, upon the urgent application of the Roman people, forwarded through their bishop, he removed to Rome, where he died at a very advanced age, A.D. 568. About the same time Alboin was crossing the Noric Alps to invade Italy. (Agathias; Paulus Diaconus; Gibbon.)

NARUSZEWICZ, ADAM STANISLAUS, a voluminous Polish writer, was born October 20th, 1733, and at the age of fifteen entered a seminary of the Jesuits, where his abilities and application so greatly recommended him to his instructors, that he was sent to the college of Jesuits at Lyon, and on quitting it was enabled, by the liberality of his patron, prince Czartorysky, to travel through Italy, France, and Germany. Having employed the opportunity thus afforded him in acquiring information and perfecting himself in various branches of study, on his return to his native country he was appointed professor of poetry at the university of Wilna. Within a short time afterwards he was promoted to a similar professorship in the College of Nobles at Warsaw. The reputation his talents now procured for him also the notice of the king Stanislaus Augustus, who, besides other repeated marks of his favour, conferred upon him the bishopric of Smolensk after the suppression of the order of the Jesuits, and in 1790 that of Lukow. He died July 6th, 1796, in his 63rd year.

Besides his poems, which consist of fables, satires, pastorals, and several books of odes and other lyrical pieces, including several imitated from Anacreon and Horace, he wrote a 'History of Poland,' in six volumes, a translation of Tacitus, a description of Taurida or history of the Crim Tartars, a translation of all the odes of Horace, and Stanislaus Augustus' Journey to Kaniow in 1786, which contains an account of the origin of the Kosacks.

NARVA, the capital town of the circle of the same name in the government of St. Petersburg, is situated in 59° 24′ N. lat. and 28° 10′ E. long., on the west bank of the river Narowa, which comes from Lake Peipus and falls into the Gulf of Finland about ten miles below the town. It is surrounded with a rampart, and in the suburb of Ivangorod, on the other side of the river, there are the remains of a large fortress built by the czar Ivan Wassiliewitsch. Narva is divided into the old and new town, which are separated by a rampart. The houses are well built of brick, and stuccoed white. There are 7 stone and 2 wooden Greek churches, and 2 stone Lutheran churches, an Exchange, and a good German school. The inhabitants, about 4500 in number, are for the most part of German descent, and Narva looks more like a German than a Russian town. It was a member of the Hanseatic League, and has still a very considerable export trade in balks, planks, flax, hemp, corn, and furs. The fishery in the Baltic is very productive, and the lampreys and smoked salmon of Narva are celebrated. About 100 merchantmen, chiefly in ballast (the imports being much less than the exports), arrive every year, and can come up to the town; but the barks which come down the Narowa from Lake Peipus are unloaded about a mile from the town, at the island of Kragholm, where there is a fall in the river about twelve feet perpendicular.

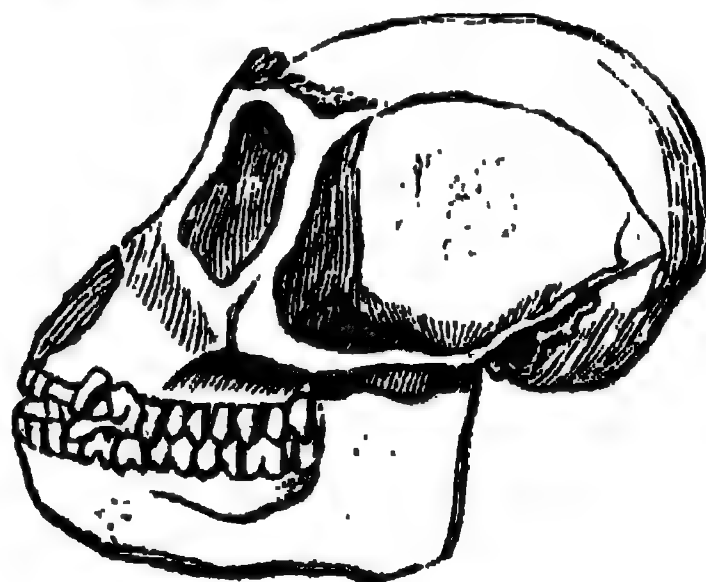
Narva was built in the year 1213 by King Waldemar, taken in 1553 by the grand-duke Ivan Wassiliewitsch, and re-taken by the Swedes in 1581. In 1590 and 1658 it was besieged by the Russians. On the 30th November, 1700, King Charles XII., with 8200 Swedes, totally defeated 80,000 Russians under Peter the Great and the duke of Croy, and stormed their intrenched camp near the town. In 1704 however Peter the Great took it by storm, and it has ever since remained in the possession of Russia.

NARWHAL. [WHALES.]

NASA'LIS, M. Geoffroy's name for a remarkable genus of Monkeys established on the 'Guenon à long nez' of Buffon, the *Proboscis Monkey* of Shaw, *Simia Nasica* of Schreber, *Nasalis larvatus* of Geoffroy, *The Kahau.*

ORGANIZATION AND HISTORY.

The enormous development of the nose in the *Kahau* is not dependent on bone. The nasal bones are no more elevated than they are in the rest of the *Simiadæ*, as will be perceived from the following cut of the skull of a *Proboscis Monkey* in the museum of the Zoological Society of London.



Skull of Kahau

The figure given below was reduced from the drawing of a female, when newly taken from the cask of spirit in which the body was preserved: the specimen came from Borneo, and is now to be seen, but with the nose deteriorated by drying, in the museum of that Society. It is



Face of Kahau (Female).

said that the animal has the power of dilating this organ to an enormous size by inflation.

Audebert gives the following view of the nose, as seen from beneath.



Nose of Kahau, seen from beneath.

In July, 1837, Mr. Martin laid before the Zoological Society the following observations on this Monkey:—

'The genus *Nasalis*, of which the "*Guenon à long nez*" of Buffon (*Suppl.*, vii.) or Proboscis Monkey of Shaw, is the type, was founded by Geoffroy St. Hilaire in his 'Tableau des Quadrumanes,' published in the 'Annales du Muséum d'Histoire Naturelle' for 1812. In this outline of the *Simiadæ* the genera *Semnopithecus* and *Cercopithecus* are blended together under the latter title; but from this group are excluded two Monkeys, the *Douc*, constituting the type of the genus *Pygathrix* (*Lasiopyga*, Ill.) and the "*Guenon à long nez*." With respect to the genus *Pygathrix* or *Lasiopyga*, founded upon the alleged want of callosities, most naturalists, I believe (aware of the error committed both by Geoffroy and Illiger, in describing from an imperfect skin), have regarded it as merging into the genus *Semnopithecus*, at least provisionally, until the internal anatomy of its assumed representative be known.

'The characters of the genus *Nasalis*, formed for the reception of the "*Guenon à long nez*" (*Simia Nasica*, Schreb.; *Cercopithecus larvatus*, Wurmb), are laid down as follows:—

'"*Muzzle* short, forehead projecting, but little elevated; *facial angle* 50°; *nose* prominent, and extremely elongated; *ears* small and round; *body* stout; *cheek-pouches*; *anterior hands*, with four long fingers and a short thumb, ending where the index-finger begins; *posterior hands* very large, with fingers stout, especially the thumb; *callosities* large; *tail* longer than the body."

'At a subsequent period, however, in his 'Cours de l'Histoire Naturelle,' published in 1828, Geoffroy, adopting the genus *Semnopithecus*, established by Fred. Cuvier, places the "*Guenon à long nez*" within its limits, doubtfully, it is true, and with the acknowledgment that his genus *Nasalis* has not been generally adopted, but at the same time with a bias in its favour; for, observing that the manners of these Monkeys are those of the *Semnopitheci*, he adds, "Cependant, il ne nous parait encore démontré que le singe nasique soit une véritable semnopitheque, et il est fort possible que lorsque l'espèce sera moins imparfaitement connue, on soit obligé de rétablir le genre *Nasalis*, dans lequel on l'isolait autrefois, mais qui n'est pas été admis par la plupart des auteurs modernes."

'Setting aside the singular conformation of the nose, so remarkable in the *Simia Nasalis*, its external characters are not different from those of the *Semnopitheci* in general; and it is to be observed that in a second species, lately added by Mr. Vigors and Dr. Horsfield, under the title of *Nasalis recurvus*, the proportions of this part of the face are much diminished, and its form also modified. This species (which, though doubted by some as being distinct, is, we believe, truly so) takes an intermediate station between the *Simia Nasalis* and the ordinary *Semnopitheci* with flat noses, thereby showing that the transition in this particular character is not abrupt; even were it so, an isolated point of this nature does not form a philosophical basis upon which to ground a generic distinction.

'So far I have alluded to external characters only; it remains for me to give some account of the anatomical characters of this singular Monkey, of which, as far as I can learn, modern naturalists do not appear to be aware.

'It would seem that M. Otto,* who described the sacculated form of the stomach in one of the Monkeys of the genus *Semnopithecus*, is not the first observer of this peculiarity, for I find that Wurmb, in the 'Memoirs of the Society of Batavia,' notices this point in the anatomy of an individual of the *Simia Nasalis*. After giving some interesting details respecting the habits and manners of the species, he proceeds as follows:—"The brain resembles that of man; the lungs are of a snow-white colour; the heart is covered with fat, and this is the only part in which fat is found. The *stomach is extraordinarily large, and of an irregular form*; and *there is beneath the skin a sac which extends from the lower jaw to the clavicles*." Audebert (with whose work, 'Histoire des Singes,' Geoffroy St. Hilaire was well acquainted) refers to this account of Wurmb; yet Geoffroy does not, as far as I can find, advert to these points, unless indeed his statement of the presence of *cheek-pouches* be founded on the observation of a sac extending from the lower jaw to the clavicles; and if so, he has made a singular mistake, for the sac in question is *laryngeal*, and the words as they stand cannot be supposed to mean anything else. I know of no Monkey whose cheek-pouches extend beneath the skin to the clavicles; but the laryngeal sacs in the *Orang* and *Gibbons*, and also in the *Semnopitheci* themselves, are remarkable for development. It is evident however, from the silence of M. Geoffroy St. Hilaire respecting the laryngeal *sacculus* in the Proboscis Monkey, that he was not aware of the real character of the structure to which Wurmb had alluded. With respect to the structure of the stomach, neither Wurmb nor M. Otto drew any general inferences from it; they described it as it presented itself in single species, and regarded it in an isolated point of view; it is, if I mistake not, to Mr. Owen that we owe its reception as an anatomical character extant throughout the *Semnopitheci*. (See his paper on the subject, in the *Proceedings for* 1833, and in the *Transactions of the Zoological Society*.)

'This is perhaps scarcely the place in which to introduce any speculations, but I cannot help observing that the same structure may be expected in the genus *Colobus*, which in form is a mere repetition of the genus *Semnopithecus*, except that the thumb of the fore-hands, which in the latter begins to assume a rudimentary character, is in the former reduced to its lowest stage of development. In both genera the teeth precisely agree, and present early that worn surface which is the consequence of a continued grinding *rodent-like* action upon the leaves and herbaceous matter which constitute the chief diet of the animals.

'The statement of Wurmb respecting the stomach and laryngeal apparatus of the Proboscis Monkey I have lately been enabled to confirm.

'Among the specimens in store brought within the last few months from the Gardens to the Museum occurred an example of the Proboscis Monkey, in brine, but in a state of decomposition which induced me to lose no time in making such an examination as its condition would admit, being indeed extremely anxious to ascertain the relationship of this curious Monkey to the other groups of Indian *Simiadæ*, groups to which I have been lately directing my attention.

'The specimen in question was a female, measuring, from the *vertex* to the *ischiatic callosities*, one foot nine inches.

'The body was meagre and slender, and the limbs long and slim; the contour of the animal being very unlike that displayed in the mounted specimen in the Museum of the Society, which gives the idea of great robustness.

'The abdominal cavity had at some former period been opened and the liver removed, in doing which the stomach had been cut, but not so much as to spoil it entirely. In every essential point this *viscus* is the same as in all the *Semnopitheci* hitherto examined: it consists of a large cardiac pouch, with a strong muscular band running as it were around it so as to divide it into two compartments, an upper and lower, slightly corrugated into *sacculi*; the *cardiac apex* of the upper pouch projects as a distinct *sacculus* of an oval form, and is not bifid. From this *upper pouch* runs a long and gradually narrowing *pyloric portion*, corrugated into *sacculi* by means of three muscular bands, of which one is continued from the band dividing the cardiac pouch into two compartments. The elongated *pyloric portion* sweeps around the *lower cardiac pouch*.

'The *œsophagus* enters the first compartment about four inches from its terminal apex, giving off a radiation of longitudinal muscular fibres over the central portion of the first compartment. The second or lower compartment is the largest and deepest, and is embraced by longitudinal

* See his paper in the 'Nova Acta Academiæ Cæsareæ,' vol. xii.

muscular fibres from the œsophagus to the division-band, but, unlike the same compartment in the stomach of the *Semnopithecus Entellus*, it is very slightly sacculated; indeed it can scarcely be said to be so at all. The admeasurements are as follow:—

	feet.	inches.
'1st compartment, round the greater curve	1	6
2nd compartment, measured in the same manner	1	8½
From the entrance of the œsophagus, round the 2nd compartment, to the division-band	1	1
The same measurement, round the 1st compartment	0	8½
Length of *pyloric portion*	2	1
Circumference at base	0	9¼
Circumference just above pyloric orifice	0	5½
Length of small intestines	18	0
Length of large intestines	6	2

'The average diameter of the small intestines, lying flat, was ¾ of an inch; the ileum however was rather more, but not quite an inch.

'The *cæcum* is of a pyramidal figure, 5 inches in length, pointed, and somewhat sacculated by three slight muscular bands. Circumference at the base, 5½ inches.

'The large intestines are puckered into *sacculi* by two longitudinal bands; they commence large, becoming gradually smaller, the bands in the mean time gradually disappearing. Advancing towards the *rectum* the intestine again enlarges; and here, to the extent of 2½ feet from the anus, all trace of bands is lost.

'The circumference of the large intestines, at their commencement, is 3¼ inches.

'The lungs consisted of two lobes on each side, the fissure dividing the lobes on the right side being the most complete.

'The laryngeal sac was of enormous size, and single. It extended over the whole of the throat, and advanced below the clavicles, communicating by means of a single but large opening with the larynx. This opening is on the left side, between the *larynx* and the *os hyoides*, and is capable of being closed by means of a muscle arising from the anterior apex of the *os hyoides*, and running down the central aspect of the *trachea* to the *sternum*. The contraction of this muscle draws the *os hyoides* down, so as to press upon the edge of the thyroid cartilage.

'There were no cheek-pouches, nor any traces of them.

'The teeth were much worn, but the fifth tubercle of the last molar tooth of the lower jaw was very distinct.'—(*Zool. Proc.*, 1837.)



The Kahau. (Audebert.)

Description.—Reddish brown, except the light-coloured tail, lower part of the back, and some light-coloured markings on the arms. Height about three feet, when nearly erect. *Female* rather less, and destitute of the light markings on the back, &c. Nose and face darkish brown.

Geographical Distribution, Habits, &c.—This species is a native of Borneo. Their habits are gregarious, and they are said to collect in great troops upon the trees bordering the rivers at sunrise, darting from tree to tree with great activity, sometimes springing a distance of fifteen feet. Their name, *Kahau*, is supposed to be given to them from their continued cries, which are considered to resemble that word in their expression. Their disposition is said to be bad. M. Lesson notices the 'on dit' that the species is also a native of Cochin China; but he gives no authority for this locality.

Mr. Vigors and Dr. Horsfield, in their paper 'On the Mammalia in the Zoological Museum,' after noticing the species above described, mention another form, of which two specimens, almost equally distinguished by the extension of the nose, but having that member turned up instead of being recumbent, brought also from Borneo, are in the same collection. This is the form alluded to above by Mr. Martin, and is thus characterised by Mr. Vigors and Dr. Horsfield, under the name of *Nasalis recurvus*. It is to be remarked that they were also preserved in spirit, and consequently were not subject to the same contraction of the soft parts of the nose as might have occurred in dried skins:—

Description.—Head, neck, shoulders, and thighs rufous above; abdomen paler; middle of the back reddish grey; inside of arms and thighs, lower part of the back, and tail, grey; tail below, white. Size about one-third less than the Kahau.

Mr. Vigors and Dr. Horsfield observe that the general colour and markings of this animal correspond with those of the Kahau. The skin of the face however, they remark, is reddish in *N. recurvus*, where in the other species it is black. In *N. recurvus*, they add, the beard is very prominent; but in the Kahau the hairs on the chin scarcely assume the appearance of a beard.



Profile of N. recurvus.

Mr. Vigors and Dr. Horsfield state that it has been suggested that this may be the young of the Kahau; but they state that they cannot allow themselves to come to the conclusion that they are the same, with so great a disproportion of the facial angles, in the absence of some stronger grounds than mere conjecture. Its teeth, they remark, showed no signs of being otherwise than adult.

Mr. Swainson appears to agree with Mr. Vigors and Dr. Horsfield and Mr. Martin, in considering *N. recurvus* distinct; for he gives the number of species of *Nasalis* as two. (*Natural Hist. and Classification of Quadrupeds.*)

NASAMO'NES (Νασαμῶνες), a barbarous people in Libya, who dwelt on the coasts of the Greater Syrtis. According to Strabo they were bounded on the west by the Psylli, and extended westward as far as the Philænian Altars, which were at the southern extremity of the Greater Syrtis (xvii., p. 836, 838, Casaub.). Herodotus places them farther to the west, and states that they occupied the country of the Psylli (iv. 173). On the east they extended beyond the Syrtis, and were bounded by the Auschisæ, a small tribe, who dwelt to the west of the Cyrenaica (Herod., ii. 32; iv. 172). Inland they had dominion as far as the oasis of Augila, in the great desert of Barca, which is 180 miles south-east of Barca, and is at the present day one of the resting-places of the caravans which trade between Cairo and Fezzan. [AUGILA.] The Nasamones were accustomed to leave their cattle on the coast in the summer season, and go to Augila to gather dates (Herod., iv. 172).

Pliny (v. 5) also places the Nasamones on the Syrtis, and says that they were antiently called Mesammones by the Greeks, because they were situated between two quicksands (μέσος, ἄμμος); meaning perhaps the two Syrtes, which however is not the case.

The Nasamones are described by Herodotus (iv. 172, 190) as a numerous nomade people, who had a community of wives, were accustomed to swear by the tombs of the bravest and justest of their ancestors, and pledged their faith by drinking out of the hands of one another, or by licking dust out of one another's hands, if they had no water.

They are described by Lucan (*Phars.*, ix. 404) and Q. Curtius (iv. 7) as a barbarous tribe, who lived by the plunder of the vessels shipwrecked on their coast. Bruce, who was shipwrecked on this coast, found that the present inhabitants followed the same practice. (Rennell's *Geography of Herod.*, ii., p. 270.)

The Nasamones were driven into the interior of the country by the Romans in the time of Domitian. (Dionys. Perieg., ed Hudson, iv. 208; Eusebii *Chron.*, Ol. ccxvi.; Joseph., *Bell. Jud.*, ii. 16, § 4.) Ptolemy places them as far inland as Augila.

Herodotus gives (ii. 32) an interesting account of an exploring expedition, undertaken by five young men of this country, who crossed the great Libyan desert, and, after traversing extensive marshes, came to a large river flowing from west to east, with crocodiles in it, which many commentators have supposed to be the Niger. [NIGER.]

NASCENT STATE, a term proposed by Dr. Priestley to express the moment at which a gaseous body is liberated from previous combination and before it has assumed the gaseous form. The nascent state has a powerful effect in occasioning chemical combination, which could not occur without it. If, for example, azotic and hydrogen gases be mixed in any proportions whatever, and be subjected either to heat or electricity, which are so efficacious in causing many other gases to combine, no union takes place between them, and consequently no ammonia is formed. If however we decompose nitric acid and water by means of tin, the azote of one and the hydrogen of the other come into contact in their *nascent state*, and before they have even assumed the form of gases, and they combine to form ammonia. Other examples of similar action might be adduced, but no one more strikingly exemplifies the meaning of the term and the efficacy of the action which it is intended to describe.

NASEBY. [CHARLES I.]

NASH, THOMAS, was born in the year 1558, at Lowestofft, in Suffolk, and closed a calamitous life of authorship in his forty-third year. Dr. Beloe has given a list of his works, and Mr. D'Israeli an account of his privations and miseries. As a wit and a satirist, he seems to have been superior to all his contemporaries; but as a dramatic poet, much below most of them. He has left only one dramatic performance entirely of his own composition, 'Summer's Last Will and Testament,' which is not to be regarded so much in the light of a play as of a spectacle. It was exhibited before Queen Elizabeth at Nonsuch in the autumn of the year 1592, but not printed till eight years afterwards. Nash was concerned with Marlow in writing 'Dido, Queen of Carthage,' 1594, which was also acted before the queen by the children of her chapel.

He had a vigorous understanding, well stored with learning, and was capable of giving powerful descriptions of things and striking characters of persons, as will be found by his 'Supplication of Pierce Penniless to the Devil,' 1592: this latter work was followed up, though with less effect, by his 'Christ's Tears over Jerusalem,' 1593. 'Summer's Last Will and Testament' has been reprinted in the last edition of Dodsley's 'Old Plays.' It has no pretention to diversity of character in the persons, nor to interest in the plot, the only part that approaches to anything like individuality being that of Will Summers (or Sommers), the jester of Henry VIII.: the piece depends upon a sort of pun between the name of the jester and the division of the year which corresponds with that name.

(Collier's *Annals of the Stage.*)

NASH, JOHN, was born in 1752, and is said to have been of Welsh extraction, but few particulars are known of his early life, or when he first began to apply himself to architecture as a profession, previously to which he followed portrait, or rather miniature painting. Perhaps it was in an evil hour for architecture, that he devoted himself to it as practitioner; for though he thereby acquired a popular reputation for himself, as the author or promoter of the very extensive improvements in the metropolis, arising out of the formation of Regent Street and the Regent's Park, the taste there displayed most certainly has not contributed to raise our national character in regard to architecture, but has rather tended to bring into vogue a sketchy, showy, and meretricious style, wherein, though richness is affected, poverty and meanness are the prevailing qualities. Notwithstanding all their pretension and finery, the terraces in the Regent's Park have more the look of barracks than of palaces;—are mere stretched-out ranges of common-place houses, garnished with columns and pilasters, insipid enough in themselves, and rendering the poverty of all the rest absolutely offensive. It has been said that for the bad taste of many of the designs both in Regent Street and the Park, he is not answerable, they being the productions of the different architects, or rather builders, who erected them; yet besides that such excuse reduces Nash to little more than the surveyor employed on that occasion, it is no excuse whatever for the paltry taste of his own designs, which, so far from being decidedly superior to all the rest, exhibit some of the very worst specimens among them. Neither is he at all entitled to the originality claimed for him as having set a new fashion in street architecture, by combining several houses into one façade, since the same thing had been done about a century before by Wood of Bath. Whatever allowance however may be made for works of that class, we may fairly take Buckingham Palace as proof of his talent; and that costly structure is a decided and most deplorable architectural failure; hardly at all superior in style and quality to the average of the designs above referred to. Here and there are some bits of prettiness, but nowhere does it manifest the slightest approach to grandeur or to real architectural taste; neither is there any redeeming point in the general conception. In the Pavilion at Brighton he succeeded better, although it is but a poor and sketchy imitation of the style attempted; he seems never to have given any study to detail, but to have contented himself with the mere generalities of form. The United Service Club-house, the Haymarket Theatre, and the Terraces in St. James's Park, and indeed almost all his works, sufficiently attest this, nor is the variety displayed in them more than a very commonplace sort of fertility. The entrance to the Queen's Mews, another of his works, is remarkable only for its barbarous ugliness.

Mr. Nash died at his villa near East Cowes in the Isle of Wight, May 13, 1835, in his 83rd year, and is said to have left very little property, notwithstanding the vast sums of money he had derived from his profession.

NASIR-ED-DIN, MOHAMMED BEN HUSSEIN AL THUSSI, a Persian and an astronomer, who died A.D. 1276, aged about 70. Having met with some slight from Al Mustassem, the kalif, he left his country and went into Tartary. Here he obtained the friendship of Hulaku (commonly written Holagu), surnamed Ilkhan, the brother of the reigning prince. It is said that Hulaku, being on the point of leading an army against Constantinople, was deterred by Nasir-ed-din, and induced to prefer an invasion of Persia. D'Herbelot treats this as a fiction, so far as the astronomer is concerned; but whether this be so or not, Hulaku overran Persia, put Mustassem to death, and fixed his seat of government at Maragha, in Azerbijan, where he collected men of science, built an observatory, and placed Nasir-ed-din at the head of both. The instruments there used are described by Delambre, from an Arabic manuscript, in the 'Hist. de l'Astron. du Moyen Age,' page 199, &c. The tables made at this observatory are called the Ilchanic Tables, from the name of their author's patron. They enjoyed great reputation in the East, and are known in Europe from the 'Synopsis Tabul. Astron. Persicarum' of George Chrysococca, printed by Bouillaud in 1645, and the Commentary of a Persian, whose Latinised name is Shah Cholgius, printed by Greaves, in 1642. The Ilchanic Tables, according to Delambre, differ from those of Ptolemy only in the correction of some of the mean motions.

Nasir-ed-din also wrote a work on geography, which was printed by Greaves in 1652, and which we believe was long the authority for many Asiatic longitudes and latitudes; also a work on ethics, and several other writings.

NASSA. [ENTOMOSTOMATA, vol. ix., p. 455.]

NASSAU or POGGY ISLANDS, THE, form a part of a chain of islands which lie off the whole length of the west coast of Sumatra, at a distance of 60 or 80 miles. There are two islands which bear this name: they lie between 2° 30′ and 3° 16′ S. lat., and are separated from each other by a strait called Si-kakap, which is about two miles long and a quarter of a mile across. This strait

forms an excellent harbour for ships of any size. It is surrounded by mountains, so that the water is literally as smooth as in a pond; and there are twenty-five fathoms of water close in-shore, and forty-five in the mid-channel. There are also some high rocks in the strait.

The surface of the islands is rough and irregular, consisting of high hills or mountains of sudden and steep ascents. The mountains are covered to their summits with trees, many of which supply excellent timber. The sago-tree grows in abundance, and affords the chief article of food to the inhabitants, who cultivate no rice. The cocoa-nut tree and the bamboo also abound. The fruits common in the islands of the Indian archipelago, such as mangosteens, plantains, &c., are numerous. The woods in their natural condition are impervious to man, and harbour various wild animals, as deer, hogs, and several kinds of monkeys. Fowl and pigs are raised, and fish are plentiful.

The inhabitants of these islands are few in number; they are divided into small tribes, each tribe occupying a little river, and living in one village. On the Northern Poggy there are seven villages, and on the southern five. The population amounted in 1792 to about 1400 individuals. In colour and stature they resemble the Malays, but they speak a language quite different from those used on the coast of Sumatra. There is some resemblance between them and the inhabitants of the islands of the Pacific in their practice of tattooing their body. They are still strangers to the use of coin of any kind. A sort of iron hatchet serves as a standard for the value of various commodities among them. They neither export nor import any article. Some Malays have settled among them for the purpose of building large boats, timber for which is found close at hand. (Crisp, in *Asiatic Researches*, vol. vi.)

NASSAU. [BAHAMAS.]

NASSAU, THE DUCHY OF, derives its name from the mountain castle of Nassau, the original seat of the Nassau family, of which only the ruins now remain, near the small town of Nassau. The extent of this duchy and its territories have undergone numberless changes in consequence of partitions, re-unions, cessions, and acquisitions. It is at present composed of 23 different territories, including all those which formerly belonged to the several branches of the family. It is comprised between 49° 55′ and 50° 50′ N. lat. and 7° 31′ 50″ and 8° 45′ E. long., and is bounded by the Prussian Rhenish provinces and by the different states of Hesse. The area is variously stated, 2226 square miles being the highest and 1743 the lowest estimate. According to the best maps, it seems to be 1900 square miles. The duchy is divided into three provinces, Wiesbaden, Weilburg, and Dillenburg, and subdivided into 28 bailliwicks. There are no large towns, Wiesbaden having only 9000 and Biberich 3000 inhabitants. The country is generally mountainous or hilly, and there is no part that can be called plain. The mountains follow the Rhine and the Lahn in their whole course through the duchy, and form delightful valleys, which are among the most romantic parts of Germany; the most picturesque is the Rheingau from Biberich to Lorchhausen, celebrated for its fine wines. This beautiful valley is protected by the Taunus from the north wind, and bounded on the south by the Rhine. There are two principal chains of mountains; on the north the wild and wooded Westerwald, and on the south east the Taunus or the Höhe, the most elevated summit of which is the Feldberg, 2605 feet, and the Altkönig, 2400 feet above the level of the sea. The climate is on the whole temperate and healthy; it is mildest in the parts about the Main; on the highest summits of the Taunus and the Westerwald, it is rather bleak and cold. Of the rivers the chief is the Rhine, which bounds the duchy on the south and west, and at Lahnstein receives the Lahn, which is navigable 14 leagues from its junction with the Rhine at Weilburg. The Main forms the boundary to the south-east. There are several smaller rivers and mountain streams, such as the Embs, Aar, Sieg, Wiedbach, Weilbach, and Niester. There are no canals and no lakes. On the other hand the country has numerous Spas and mineral springs, which are among the most celebrated in Germany: of the former we may mention Ems, Wiesbaden, Langenschwalbach, and Schlangenbad, which are annually frequented by above 19,000 visitors; and of the latter Nieder-Selters, Fachingen, and Geilenau, from which about three millions of bottles are annually exported, of which 2½ millions are Selters water. The natural productions are various and valuable. Though the farmers are very industrious, the corn raised is in general not sufficient for the consumption of the country. The fertile bailliwick of Höchst is indeed a granary to the city of Frankfort, and considerable quantities of the fine wheat and rye grown on the banks of the Aar and the Lahn are exported by means of the latter river; the wheat is of such superior quality that it fetches in Holland 25 or 30 florins per last more than that of the other countries on the Rhine and Main. Peas and beans, linseed, potatoes, flax, hemp, and tobacco are cultivated. Fruit is raised in great perfection, and large quantities are exported. But the boast of Nassau is its wine, of which that produced about Hochheim is well known by the name of *hock*; there are likewise the wines of Markebrunn, Asmannshausen, and Johannisberg; the last is the property of Prince Metternich, which the emperor Francis conferred on him in 1816 as a fief for his eminent services to the cause of Germany, the emperor retaining the feudal rights, and receiving the tithe on the wine. The prince derives from the estate an annual revenue of about 4000*l.* sterling. The breeding of cattle (especially horned cattle) is a chief source of wealth: there are about 200,000 horned cattle, 70,000 swine, 180,000 sheep, 10,000 horses, and 10,000 goats. The minerals are silver, lead, iron, copper, marble, freestone, limestone, basalt, slate, fullers' earth, and potters', pipe, and porcelain clay. There are also some salt-springs. The forests, which abound in game, supply vast quantities of timber and firewood. The smelting and manufacturing of metals are carried on to a considerable extent; there are also paper-mills, tanneries, distilleries, tobacco, vinegar, and potash works, and some woollen, leather, and linen manufactures, but on a small scale. The trade is almost wholly limited to the exportation of the produce of the country. With respect to religion, the inhabitants, who at the beginning of 1838 amounted to 379,272, are pretty equally divided between the Roman Catholic and the Protestant churches. In the year 1817 the Lutherans and Calvinists agreed to unite in one body under the denomination of Evangelical Christians. There are nearly 6000 Jews. There is a gymnasium, a military school, a seminary for teachers, a deaf and dumb institution, an agricultural school, and 658 district schools. There is no university, but the young men study at Göttingen, where there is a professor who lectures on the laws of Nassau.

The duke was formerly an absolute sovereign, but in 1817 a representative constitution was introduced, with two chambers, which have larger powers than those of some other German states. The military force amounts to 4000 men. The revenue is 1,810,000 florins: but there are debts to the amount of twelve millions of florins. The duchy has been composed of so many different territories, and the exchanges and partitions, have been so numerous, that a regular history of the country is out of the question. Otho, brother of king Conrad I., in the tenth century, is considered as the founder of the Nassau family, which after the death of Henry II. was divided into two branches, of which his sons, Wabram and Otho, were the heads. The dukes of Nassau are descended from the elder, and the house of Orange-Nassau (king of the Netherlands) from the younger branch.

Nassau together with Brunswick has the thirteenth vote in the diet of the German Confederation; in full council Nassau has two votes of its own. Its contingent to the army of the Confederation is 3028 men.

NASSAU, HOUSE OF, an antient and illustrious German family, which, having distinguished itself throughout Europe, during the sixteenth and seventeenth centuries, in the cause of civil and religious liberty, has in our own times attained the regal title with the sovereignty of the Netherlands. The counts of Nassau on the Rhine had, in the middle ages, acquired sufficient power at one period to dispute the pre-eminence with the House of Austria, and to give a sovereign (Adolphus of Nassau, elected emperor A.D. 1292) and five ecclesiastical electors to the German empire. Early in the sixteenth century the family of Nassau obtained, through marriage and bequest, the French principality of Orange in Provence, from whence their most celebrated title has been derived: but the possession of several large domains and hereditary dignities in the Netherlands had meanwhile numbered the counts of Nassau among the vassals whom the House of Austria gained by the marriage of Maximilian with Mary of Burgundy; and William I. of Nassau, prince of Orange, the true founder of the glories of his race, was the subject of the emperor Charles V. Besides William I., the most remarkable per-

sonages of his house were his son Maurice, the ablest general of his age, and his great-grandson William III., stadtholder of the United Provinces and king of England; the lives of each of these three individuals will claim a separate notice.

I. William I. of Orange was born in the year 1533, at Dillenburg in Nassau. His father having embraced the reformed doctrines, he was at first educated in those principles; but the emperor Charles V., who early interested himself in his fate, removed him to his court, and had him brought up in the Roman Catholic faith. The emperor, who is said to have foreseen and predicted the great statesman in the boy, placed him about his person, allowed him alone to be present when he gave audience to foreign ambassadors, and soon honoured him with a confidence far above his years. William merited his favour by a discretion which had already obtained for him his famous surname of 'The Silent;' and the emperor did not blush publicly to avow, that to so young a man he had often been indebted for suggestions which had escaped his own sagacity. In the last solemn act of his public life, when he abdicated his throne to his son Philip II., Charles leant on the shoulder of William of Orange; and to him also, still only in his twenty-third year, the retiring monarch committed the honourable mission of delivering over his imperial crown to his brother Ferdinand.

The esteem of Charles seems to have been sufficient of itself to excite the jealousy and distrust of his son; and, from the commencement of Philip's reign, William became to that gloomy and suspicious despot an object of hatred and fear, which he repaid with deep though dissembled indignation. The state of religion in the Netherlands enabled him to convert those provinces into a theatre of action for projects which have been variously attributed to his patriotism or revenge, but which perhaps may with more probability be ascribed to the mixed motives that usually influence human conduct. While his benefactor Charles was on the throne, William had adhered to the Imperial creed; but after the abdication of that monarch we find him embracing Calvinism with the same facility with which he had in earlier years deserted the Lutheran for the Roman Catholic faith. This last transition was yet undecided or unknown when he was resident at the court of France as a hostage for the peace of Cateau-Cambresis; and the French king, Henry II., believing him to be as deep in the confidence of Philip II, as he had been in that of Charles V., incautiously spoke to him of the secret treaty which the crowns of France and Spain had recently concluded for the extirpation of the Protestants in the dominions of both.

This disclosure had a double consequence; for William hastened to communicate it to the leaders of the Protestant party in Brussels, and Philip II. discovered that he had given the information. The existence of this treaty and its detection served to increase the antipathy between William and his sovereign; but the dissimulation which belonged to their characters in common long prevented any open rupture, and for several years, while the Netherlands remained under the feeble administration of Margaret of Parma, the Prince of Orange, as a member of the Flemish council of state, and as stadtholder of Holland, Zealand, and Utrecht, covertly but indefatigably employed himself in undermining the tyrannical designs of Philip. The tortuous and often treacherous policy pursued by William during all this period can only be approved by that class of politicians in whose estimation the means are justified by the end. At length the approach of the energetic and sanguinary duke of Alva, to whom Philip had transferred the government of the Netherlands from the hands of Margaret of Parma, warned William that it was time to throw off the mask; and he avoided the tragical fate of his friends, the counts Egmont and Hoorne, by retiring from the Low Countries to his paternal domains of Nassau.

In the following year, 1568, the detestable tyranny and inhuman cruelties of Alva against the Protestants in the Netherlands, his own wrongs, and the appalling sufferings of a people whom he loved, roused William from his retreat, and thenceforward he stood forth the fearless and zealous champion of the great cause, which he is supposed to have embraced less from religious than from political motives. His efforts in arms were for the most part unsuccessful; for the raw and heterogeneous levies which he was enabled to make among the German and French Protestants for the succour of the unwarlike people of the Netherlands were no match for the veteran Spanish and Italian bands which Alva had led into the Low Countries. But every disadvantage under which William contended in the field with Alva and his skilful successors, Don John of Austria and Alessandro Farnese of Parma, was more than counterbalanced by his consummate abilities as a statesman, which enabled him finally to triumph, not only over his Spanish enemies, but over every rival in the councils of the revolted provinces. The archduke Mathias of Austria and the duke of Anjou, both of whom had been invited by the party opposed to William to assume the government of the insurgent states, found their authority less durable than his influence; and it was by his suggestions and under his auspices that the seven Protestant provinces of Holland, Zealand, Utrecht, Friesland, Groningen, Overyssel, and Guelderland, concluded, in 1576, the famous Union of Utrecht, which formed the lasting basis of the Dutch republic. [Netherlands]

Philip II. no sooner heard of this decisive measure than he showed his sense of its importance and his dread of its author by setting a price upon his head. So atrocious a temptation, combined with fanatical zeal, soon produced two attempts upon the life of William, from the first of which he escaped with a wound. The second was more successful, and he fell at Delft, in the year 1584, by a pistol-shot from the hand of one Balthazar Gerard, a Burgundian, who had been instigated or encouraged to the deed by Roman Catholic priests. William was four times married, and left, besides daughters, three sons, of whom Philip William, the eldest, having been seized in his youth by Alva, sent to Spain, and educated in that country in the Roman Catholic faith, was ultimately restored to the principality of Orange, and the two others, Maurice and Frederic Henry, successively attained the dignity of stadtholder of the United Provinces.

II. Maurice of Nassau, the second surviving son of William I., was born in 1567, and named after his maternal grandfather, the celebrated elector Maurice of Saxony, whose military genius he inherited. Although only seventeen years of age when his father was assassinated, the states of Holland and Zealand showed their gratitude to the memory of their deliverer by immediately electing young Maurice their governor or stadtholder; and though the count of Hohenloe was at first appointed his lieutenant to aid his inexperience, he soon proved himself capable of the unassisted conduct of military affairs. For a time indeed his further rise was impeded by his extreme youth, and by the desire of the States to gratify Queen Elizabeth of England through the elevation of her unworthy favourite, the earl of Leicester, to the supreme command of their forces. The proceedings of that nobleman however soon gave them just grounds of suspicion and disgust, and in 1587 they solemnly elected Maurice to fill, in his absence, the office of captain-general of the whole Seven United Provinces, a dignity which accordingly devolved altogether upon him, when the misconduct of Leicester had at length compelled the queen of England to relieve the Netherlands of his presence. At this epoch a great part of the territory of the Seven United Provinces was still in the hands of the Spaniards; but Maurice began vigorously though gradually to make head against them. In 1591 he displayed his skill and activity by the capture of Zutphen, Deventer, Nimeguen, and other important places; and his successes had now infused such confidence into the States and people, that he was received at the Hague with transports of public joy. In 1593 he took Gertruydenberg, after a memorable siege, and Groningen in the following campaign. The progress of the republican arms was marked during some years principally by the reduction of those and other fortified places; but in 1597 Maurice, with the aid of the English auxiliaries under Sir Francis Vere, completely defeated the Spaniards in his first ranged battle at Turnhout in Brabant; and three years later, in 1600, he obtained at Nieuport, with the same confederates, a second and more brilliant victory over the archduke Albert of Austria.

Thenceforth, until the recognition by Spain of the independence of the Seven United Provinces in the truce for twelve years, which was concluded in 1609, Maurice continued to extend the successes of the states, and to raise the glory of their arms. The undoubted talents of the great generals to whom he was opposed, and over whom he gained many advantages, signally enhanced his own reputation: for, after having baffled in his youth the enterprises of the renowned duke of Parma, Alessandro Farnese he found,

in his later career, another worthy opponent, in the equally famous Italian, Spinola, who had succeeded to the command of the Spanish forces. Under such leaders, the operations of the hostile armies in the Netherlands riveted the attention of the world; and the camp of Maurice, as well as that of Parma and Spinola, being thronged with volunteers of distinction from every quarter of Europe, became the great school of military instruction.

The cessation of hostilities exhibited the qualities of Maurice in a less favourable light. He had laboured from selfish views to obstruct the conclusion of the truce with Spain, and was successfully opposed in these and other ambitious designs upon the liberties of the republic, by the pensionary Barneveldt, a man of real patriotism, eminent ability, and incorruptible integrity. But the religious disputes, which arose in the republic at this juncture between the Calvinists and Arminians, enabled Maurice to revenge himself upon the pensionary. Barneveldt being attached to the Arminian opinions, Maurice placed himself at the head of the opposite faction, the Calvinists, or Gomarists, as they were called after Gomar, the professor of theology at Leyden, who had been the antagonist of Arminius. As the Gomarists composed the great mass of the people, that party at length prevailed; the Arminian preachers were banished; and, in 1619, at the age of seventy-two years, the virtuous and venerable Barneveldt, who had for nearly half a century served the republic as successfully in the cabinet as Maurice had done in the field, was, by the machinations, and to the eternal dishonour of that prince, brought to the scaffold after being convicted on various false charges, of which the principal was, that he had 'troubled the state and religion.' [BARNEVELDT]

The stadtholder, who by the decease of his elder brother had succeeded, in 1618, to the principality of Orange, gained little by his persecution of Barneveldt. After the death of the pensionary, the people awoke to a sense of their injustice and ingratitude to that patriot; and his oppressor Maurice suddenly became as hateful and suspected in their eyes, as he had hitherto been popular. His designs of acquiring the sovereignty of the states were perceived and frustrated; and whenever he appeared in public, groans and execrations pursued him as the murderer of Barneveldt.

The resumption of hostilities with Spain, at the expiration of the truce in 1621, turned the tide of public indignation; and Maurice again appeared in arms to measure himself against his old antagonist Spinola. The fortune of the contest however between these two great commanders was now so nicely balanced, that it would be difficult to assign the palm of victory to either. In 1622 Maurice compelled the wily Genoese to raise the siege of Bergen-op-Zoom, after having expended on it the lives of ten thousand of his veteran troops: but three years later, Spinola succeeded in reducing Breda, notwithstanding all the efforts of Maurice, and so much to his mortification, that the circumstance is believed to have produced or hastened his death, which occurred on the 23rd of April, 1625, and in the fifty-eighth year of his age. He left no legitimate offspring, and was succeeded, both in the principality of Orange and stadtholdership of the United Provinces, by his half-brother, Frederic Henry.

The character of Maurice of Nassau was favourably distinguished only by military genius. As a statesman he was without the sagacity and prudence of his father; as a man, in his treatment of Barneveldt and his family, he showed himself devoid of honour and humanity; and the violence and grossness of his nature were redeemed by no virtue of private life. But, as a general, he must ever be numbered among the greatest masters of his art, and may, in fact, be regarded as the founder of the military science of modern Europe. He was at least the earliest restorer among the moderns of the true principles of warfare, which he had deeply studied in the enduring lessons of classical antiquity, and as carefully applied to the exigencies of his own times. He was the first to methodise the practice of sieges, encampments, and marches; and he introduced numberless reforms in the armament, training, and formation of troops. He taught a cavalry of inferior physical weight to engage in close encounter, and to overthrow the ponderous masses of the old gens-d'armerie; he first accustomed the infantry to a systematic management of their arms; and to his institutions must be referred that uniformity of exercise and regularity of movement which have become the simplest elements of martial discipline. To this may be added, that the celerity, as well as good order of his marches, the able arrangements by which he husbanded the lives and health of his troops, and the felicitous skill with which his camps were chosen and secured from assault, are the constant subjects of contemporary eulogy. He excelled particularly in the art of fortifying, besieging, and defending places; and, as the circumstances and localities of the contest in which he was engaged rendered such operations less perilous for the States than the hazard of decisive encounters in the field, his successes were gained more by a war of sieges, marches, and entrenched camps, than of great battles. But the victories of Turnhout and Nieuport were not the less the triumphs of his tactical system. Those actions were the first important defeats inflicted upon the Spanish bands, who had so long been the terror of Europe; and it was in the school of Nassau that the fundamental rules of military science were established, which, within less than half a century, finally prevailed over the slow and cumbrous array of the Imperial and Spanish service, in the plains of Lutzen and Rocroi.

III.—WILLIAM III. of NASSAU, Prince of Orange, stadtholder of the United Provinces, and ultimately king of England,—the great champion of the civil and religious liberties of Protestant Europe,—was born in the year 1650, and was the posthumous son of William II. of Orange, by Mary, daughter of Charles I., king of England. As William II. was the eldest son of the stadtholder Frederic Henry, who was the youngest son of William the Silent, by Louisa, daughter of the famous admiral Coligni, William III. was great-grandson of the founder of the Dutch republic, and was also lineally descended, in the female line, from the renowned leader of the Huguenots. Not only had a father's care been denied to the birth and infancy of William III., but his youth was destined to suffer for the errors of his parent. The stadtholder Frederic Henry, unlike his brother Maurice, had administered his office without attempting to violate the liberties of the republic, or giving umbrage to the jealousy of the States: but his son William II., even in the brief career which was cut short by death in his twenty-fourth year, contrived, by his violence and infringement of constitutional rights, to revive public suspicion of the designs of his house against the freedom of the commonwealth; and the party opposed to the Orange interest took advantage of the helplessness of his infant son to prevent his succeeding by election to the dignity of stadtholder, which had become, as it were, hereditary in the line of Nassau. The alliance of that family with the house of Stuart had also excited the jealousy of Cromwell, whose power was now in the ascendant; and, when peace was concluded between the two republics of England and the United Provinces, in 1654, the imperious demand of the protector, that all the states should solemnly engage to exclude the infant prince of Orange and his descendants prospectively from the stadtholdership, was only satisfied by a secret engagement to the same effect, to which Holland, as the leading province of the Union, disgracefully acceded.

The restoration of the Stuarts to the British throne, in a few years, tended however at once to raise the hopes of the adherents of the house of Orange, and to increase the disquietude of their opponents; and, in 1667, the republican or aristocratic party, headed by the two celebrated brothers, John and Cornelius de Witt, succeeded in inducing the States to pass the 'Perpetual Edict,' for ever abolishing the office of stadtholder. But the iniquitous aggression of the French king, Louis XIV., upon the republic in 1672, soon put an end to the operation of this edict. However pure might have been the intentions of the De Witts, their measures had left the republic defenceless. Confiding in the friendship of France, and distrusting the best officers of the army, as devoted to the House of Orange, they had, by reductions and neglect, so weakened the land forces of the republic, that resistance to the invaders seemed hopeless. The Orange party were loud in their clamours against the administration of their rivals; and the populace, who had always been favourable to the family of Nassau, were instigated to revolt. Their fury was directed against the De Witts, whom they murdered with horrid barbarity; and the young prince of Orange was tumultuously raised to the proscribed dignity of stadtholder.

William III. was only in the twenty-second year of his age when he was thus suddenly called to the government of a factious and distracted state, a lawless populace, and a dispirited and disorganized army. With such means was

he required to arrest the progress of the victorious king of France at the head of a veteran army of 100,000 men, aided by the best generals of the age, and supported by the whole power both of his own crown and of that of England, which the baseness of Charles II. had rendered subservient to his ambition. But, happily for his country and the world, William at once displayed the same characteristics of a firmness and sagacity far beyond his youthful years, which seem to have been the heir-looms of his race, and equally to have distinguished him with his great ancestors William the Silent and Maurice. He indignantly repelled all the efforts of the combined kings of England and France to seduce him from the cause of the republic; and when Buckingham, the favourite of Charles II., asked him if he did not see that the destruction of the commonwealth was inevitable, he replied, 'There is one means by which I at least shall be sure not to witness the ruin of my country: I will die in the last ditch.' His magnanimous spirit he knew how to infuse also into his despairing countrymen, who cut the dikes of their lands, and resigned the fertile fields, which their ancestors had rescued from the sea, to the ravages of that element, rather than yield them to their invaders. The example of their young leader taught them to spurn the insolent demands of their enemies; and it appears among the miracles of history, that, in two short campaigns, the French armies, which had overrun the United Provinces, and penetrated almost to the gates of Amsterdam, were entirely driven out of the territory of the republic. In 1674, the young prince of Orange even dared every measure to bring the veteran Condé to a battle; and, though he suffered for his temerity at Seneffe, he so nobly conducted himself in that defeat as to extort from his illustrious opponent the generous avowal that 'he had acted in everything like an old captain, except in venturing his life too much like a young soldier.'

During the remainder of the war, which, after a separate peace between England and the States, was protracted with France for four years, and concluded by the peace of Nimeguen in 1678, William continued to give abundant proofs both of his political and military talents; and, shortly before the close of hostilities, he had effected a personal alliance, which largely influenced the fortunes of his subsequent life. This was his marriage with his cousin Mary, eldest daughter of James, duke of York, and heiress presumptive to the British crown. It is not easy to comprehend the readiness of Charles II. to adopt a measure so contrary to his usual policy and inclinations as this union of the princess with William, who, though his nephew, had thwarted his designs and offended his wishes by his maintenance of the republican cause. But dread of the growing discontents of his people, and a belief that the marriage would dispel the suspicions excited by his brother's religion, are supposed to have been motives sufficient to obtain his consent; and he invited or permitted his nephew to pay him the visit in England during which the alliance was concluded. To William the union presented obvious advantages: yet he honourably declined any proposals on the subject until he should be allowed to make the acquaintance and ascertain the inclinations of the princess; and this disinterestedness was not without its reward in the harmony which distinguished the course of his domestic life with his consort.

Neither the prince of Orange nor Charles II. and his brother probably foresaw all the consequences of this union to the politics of Europe. But no event of William's fortune contributed so essentially to the furtherance of that great design which had become the master passion of his mind—the reduction of the tyrannical power of Louis XIV. and the security of the liberties of the Protestant world. To these great objects, from the first hour in which he had been called to the defence of his country, his whole life was consistent; and in whatever degree motives of personal ambition, whether unconsciously to himself or otherwise, were mingled in his plans, he never appears to have suffered any consideration for an instant to interfere with his pursuit of the great cause to which he had devoted himself. Many circumstances contributed to place him at the head of the general league, provoked by the aggressive power of Louis XIV., in resistance to which his first glory had been won. The revocation of the Edict of Nantes, in 1685, by that monarch, and his persecution of his Protestant subjects, had justly alarmed and outraged all their European brethren of the same faith; the insolent pretensions of Louis had given mortal offence to the emperor and king of Spain; the apprehensions which experience had taught the United Provinces to entertain of the projects of the French king naturally rendered the court of their stadtholder the centre of negotiations against him; and various causes of hatred and fear enabled William to combine the States themselves and the Protestant princes of Germany, with the two Roman Catholic monarchs of the house of Austria and other powers, in the celebrated league which was concluded against Louis XIV. at Augsburg, in 1687. To the completeness of that great European confederacy nothing was wanting but the accession of England; and this was obtained, in the only manner which the alliance of her new king, James II., with France rendered practicable, by his insane attempt to overthrow the national faith.

Ever since his marriage, William had studiously abstained from taking part in the struggle of parties in England; and though, through his activity in thwarting the schemes of the French king, he had not been able to escape the displeasure of his uncle Charles II., he had lived on decent terms with his father-in-law, and since his accession had proffered him aid in suppressing the rebellion of the duke of Monmouth. But when he publicly refused to support the repeal of the Test Act, James began both to treat him as an enemy and to take injurious measures against the United Provinces; and, on the other hand, all the English Protestants turned their eyes to the prince of Orange for the protection of their liberties and faith. On the invitation of the principal persons both of the Whig and Tory parties, William was at length induced to undertake an expedition into England for the restoration of the national rights; and having arranged his preparations with consummate skill, he sailed from Holland with an army of about 14,000 men, composed partly of Dutch troops and partly of English regiments in the service of the States, and landed at Torbay, on the 5th of November, 1688.

This interference of William in the domestic politics of England has been variously viewed by opposite parties, as the most glorious, or the most questionable act of his life. But it cannot be denied that it was in perfect consonance with the whole tenor of his principles and his policy. The measures of James II. struck at the very existence of the Protestant faith; and their success might have been fatal also to the cause of civil freedom in Europe, to which William was equally attached. The birth of a male heir to the crown of England, by James's marriage with a princess of the Roman Catholic communion, may have quickened the zeal of William; and the double injury to his wife's title, consequent upon a prior right and a Roman Catholic succession, doubtless had its influence upon his mind. Yet there is no reason to discredit his sincere anxiety for the Protestant cause, which without these interested motives might assuredly have prompted his enterprise. The dethronement of a father-in-law has sometimes been imputed to him as a deed of unnatural guilt; and, if the affections of private life were usually permitted to have sway in the breasts of princes, it would not be easy to justify William in having made his wife an accomplice in the expulsion of her father. But he had himself personally little reason to love James, who had reluctantly received him as a son-in-law, and never cordially courted his friendship or gratitude; nor had there at any time been circumstances of private regard between them to outweigh considerations of public duty or personal interest.

The landing of William in Torbay was followed, after a few days of hesitation, by an almost total defection of James's English subjects from their allegiance; and with unparalleled ease and rapidity was that memorable and bloodless revolution effected which changed the royal line and firmly established the constitution of these realms. For once all parties and orders of men in the nation, except a very small minority of Roman Catholics, peaceably concurred in the necessity for a change of government; and when the betrayed and misguided king fled to France, the most opposite principles of passive obedience and popular rights were strained to the same practical conclusion, that James II. had either deserted or forfeited the throne. The all-important question, in what manner the vacant regal seat should be occupied, terminated the short-lived concord of factions. But William, whether moved in part by a mere selfish ambition, or wholly by a better conviction of the public exigencies of the crisis, at once cut short all schemes of the high monarchical party for restricting his functions to

a regency, either on behalf of his wife or her infant brother. He declared that, except as king, he would not remain in the country. This decisive language hastened the proceedings of the convention parliament, which William had composed of the peers, the surviving members of the three last houses of commons, and the corporation of London; and in the famous Act of Settlement passed by that body, the crown, with constitutional limitations to its power, was conferred jointly upon the prince and princess of Orange, with remainder successively to the issue of the latter, to the princess Anne and her children, and to the heirs of William by any other wife.

Notwithstanding the ease with which William III. thus acquired the British crown, he was soon compelled to contend in arms for its preservation. In Scotland the cause of James was upheld by the gallant viscount Dundee, but perished with his fall in the brief moment of victory. In Ireland, the struggle maintained by James's Roman Catholic adherents was more obstinate; but William in person inflicted on them a memorable defeat at the passage of the Boyne in 1690; and the capitulation of Limerick in the following year completed the submission of Ireland. Meanwhile William had the satisfaction, the greatest probably which his new dignity gave him, of engaging England in the League of Augsburg. The war of that confederacy against Louis XIV., of which the principal conduct was intrusted to William, had indeed little success; for though possessed of considerable military talents, he wanted that good fortune which the antients numbered among the most indispensable attributes of a great general; and he sustained in the course of this struggle two severe defeats from the French under the duke of Luxemburg at Steenkirk and Neerwinden. By the peace of Ryswick, which terminated the war in 1697, little more was gained from the French monarch by the allies than the recognition of William III. as king of England.

The possession of that throne had meanwhile given him little happiness. Though almost all the nation had at first concurred in the Revolution of 1688, the tory and high church party were in general indisposed to the pretensions and person of the new king. The Whigs were still full of jealousy of the royal power; and the cold reserved temper and ungracious manner of William disgusted and alienated the minds of his subjects in general. His most favourite schemes were continually thwarted in parliament; his whole reign was harassed with intrigues of faction and plans of insurrection at home; and his life and throne were assailed from abroad with base plots of assassination by the adherents of James II., and with projects of invasion undertaken by Louis XIV. for the restoration of the dethroned king. To add to the distresses of William, he experienced in 1695 a severe domestic calamity in the loss of his queen-consort Mary, to whom he was deeply attached. Her decease, as she left no issue, terminated all claim of her husband to the crown in the eyes of that part of the nation who had been reconciled to his government by the semblance of hereditary right in her participation of the throne. His measures now experienced systematic opposition from all parties: from the Jacobites, as the partisans of the exiled monarch were termed, who of course regarded him as a usurper; from the Tories in general, to whom he was personally obnoxious; and from the Whigs and republicans, who desired in various degrees to lower or annul the royal power. The first use therefore which was made in parliament of the peace of Ryswick was to compel him to reduce the army to an insignificant remnant of guards and garrisons, and to send out of the kingdom the regiments of French Protestant refugees, as well as his own Dutch guards; and these and other mortifications had such an effect upon his mind as to extort from him a passionate expression of his regret that he had interfered in the affairs of a nation at once so ungrateful and so suspicious.

From the annoyances of his position in England, he sought relief by renewing with more ardour than ever his attention to the affairs of Europe, and by pursuing his favourite project for humbling the power of the French king, which the precarious health of Charles II., the childless monarch of Spain, and the pretensions of the house of Bourbon to the inheritance of his dominions, threatened to render more dangerous than ever. To avert these impending evils to the balance of power in Europe, William successively negotiated two treaties of partition for the Spanish monarchy, to both of which Louis XIV. was an artful and faithless subscriber; for when the Spanish king, in indignation that other powers should dismember and distribute his dominions, bequeathed them at his death, in 1700, to Philip duke of Anjou, second son of the dauphin, Louis XIV., in spite of every obligation of treaties, accepted the testament for his grandson.

William III., now in declining health, was sensibly affected by this defeat of all his labours: but he applied himself with his usual energy to form a new league against France; and the insulting conduct of Louis XIV. at this crisis, in giving the son of James II., on the death of that prince, the title of king of England, so exasperated the British nation, that they eagerly seconded William's wishes for a war. But, in the midst of eager preparations for the commencement of hostilities, William's life was suddenly brought to a close. His constitution, originally frail and sickly, had now been completely exhausted by a career of incessant and harassing anxieties. An accidental fall from his horse, by which he broke his collar-bone, gave a fatal shock to his worn-out frame; and he expired at Kensington palace, on the 8th of March, 1702, in the fifty-second year of his age.

With the death of William III. the male line of William the Silent became extinct; and the states-general were not sorry to leave the stadtholdership vacant, and tacitly abolished. But William had named for his personal heir his cousin John William Friso, prince of Nassau-Dietz (grandson of his aunt Albertina Agnes by William Frederic of Nassau-Dietz), from whom the present royal line of Orange is descended. The following has been the succession of the princes of this house:—

William (IV.) Henry Friso, son of John William Friso, born in 1711; married Anne, daughter of George II. of England; was raised by the Orange party to the stadtholdership in 1747, and died in 1751.

William (V.) Batavus, son of William IV., born in 1748, was declared stadtholder (under the guardianship of his mother) in 1751; was expelled by the French in 1795, renounced the dignity of stadtholder by treaty with France in 1802, and died in 1806.

William (VI.) Frederic, son of William V., born in 1772, was restored to the dignities of his family in 1813, was proclaimed king of the Netherlands under the auspices of the Congress of Vienna in 1815, and still survives; having two sons, the eldest of whom, William Frederic Charles, prince of Orange, has also male issue.

(The principal authorities consulted for the preceding sketch of the most illustrious members of the house of Nassau are—*La Généalogie des Illustres Comtes de Nassau*, Amst., 1624; *Commentaries of Sir Francis Vere*, Cambridge, 1657; Grotius, *Annales et Historiæ de rebus Belgicis*, Amst., 1658; Le Clerc, *Histoire des Provinces Unies*, Amst., 1723-28; Burnet's *History of his own Time*; Hume and Smollett's *History of England*, &c.; and *L'Art de Vérifier les Dates*, Paris, 1818-19.)

NASTU'RTIUM, an old word applied to some kind of pungent herb, such as cress. By the English of the present day it is given to the Tropæolum majus, an American annual with pungent fruit; by botanists, to the Watercress and plants allied to it; by the Romans it was applied to a plant resembling Mustard in its qualities.

NA'SUA. [URSIDÆ; VIVERRIDÆ.]

NATAL, THE COAST OF, extends along the eastern side of Africa from the boundary-line of the Cape Colony, which, since the last war with the Amakosas, is formed by the Kei river (32° 30′ S. lat.), to Dalagoa Bay (26° S. lat.), and constitutes the shores of Kafferland. Along the sea it is low, and in many parts swampy. Some of these swampy grounds extend far inland, especially towards Dalagoa Bay; but in general the country begins to rise within a few miles from the sea. The rise is rather rapid, for some miles farther inland the country is said to have an average elevation of 500 or 1000 feet above the sea level, and to present the appearance of a hilly plain, here and there covered with swamps, but mostly intersected by narrow deep valleys, through which the rivers run to the sea. The declivities of the hills are partly covered with forests and bushes, and partly bare and red owing to the iron-ore which they contain. The numerous rivers and mountain torrents after rains sometimes rise to an astonishing height, and their waters fill up the narrow valleys, through which they rush with terrific violence. As all the rivers abound in cataracts, and alternate depths and shallows, they are

not navigable except for a few miles from the mouth. Nearly all of them have a huge sand-bank at their entrance, which prevents all access, and renders them useless as harbours even for small vessels. Most of the rivers have also a comparatively short course, as they rise in a high and continuous ridge of mountains, which runs parallel to the shores of the sea at the distance of about 80 miles. The elevated country mostly serves as pasture-ground, and is always covered with grass, as a want of rain is seldom experienced there, except towards the southern extremity, where the country frequently suffers from continual drought. During the summer months the grass is generally brown and dry, and towards the end of the dry season it is burnt by the natives, in order that the cattle may enjoy the new and tender herbage which comes after the first rains. On these elevated grounds there is generally a cool and refreshing breeze, but in the villages which are built in the deep valleys the heat in the dry season is extremely oppressive. The soil is rich, especially on the flats near the margin of the rivers, and along the hill-sides, where the natives cultivate pumpkins, melons, a species of millet, maize, sweet potatoes, and tobacco. The missionaries have introduced grapes, figs, oranges, lemons, apricots, peaches, nectarines, and some other fruits, as well as several kinds of vegetables, which in many places grow luxuriantly. The domestic animals are horned cattle, goats, and a few horses; some tribes possess also sheep. For further particulars see CAFFRARIA. (Stedman's *Southern Africa.*)

NATATO'RES, Illiger's name for the Swimming-birds, Swans, Ducks, Geese, &c.

NATCHEZ. [MISSISSIPPI, State.]

NA'TICA. [NERITIDÆ.]

NATIONAL ASSEMBLY. [MIRABEAU.]

NATIONAL DEBT. It will hardly be questioned that if we were to bring into account the wealth possessed by her citizens individually, England would be found, beyond all comparison, the richest country in Europe. The amount of her public debt, on the other hand, so infinitely beyond the public engagements of any other state, would seem to indicate that, considered apart from that individual wealth, England is poorer than the poorest among nations. It must not however be for one moment admitted that the public burthens of the country are ever to be considered in that light. The debt is owing by the aggregate of the people—*by the nation*—for whose benefit, real or supposed, it was legally contracted. It suits the general convenience, including that of the public creditor, that the nation, in its aggregate sense, should thus continue to exhibit signs of poverty in contrast with the evidences of enormous wealth; but if it were otherwise—if the public convenience, still more if the public safety, demanded such a course, the same authority which sanctioned the contracting of the debt could also oblige each individual in the country to contribute according to his fair proportion and his means towards its extinction. It would be difficult to imagine any circumstances that could render such a course expedient, and the position has been here advanced solely with the object of explaining, in a familiar way, the nature of the debt, and the manner in which the obligation to bear the burthen and contribute towards upholding the national faith presses upon every individual in the community. There is in truth no one, however high or however low his station in the country, excepting only those whose whole subsistence is drawn from eleemosynary sources, who can be said not to bear a part towards this upholding of the public faith. Every one therefore is interested in forming a correct idea concerning a matter which exercises an influence upon every act and circumstance that affects his social position and progress. This being the case, one cannot help feeling surprised at the crude and fallacious ideas that are generally entertained on the subject. It is by no means uncommon to find, among even educated persons, the impression that the national debt is a fund, a deposit of treasure, a sign of national riches; anything in short opposed to that which it really is, namely, a drawback upon the national wealth, a mortgage of the national industry for the payment of a perpetual annuity in return for capital advanced to meet the national exigencies, and which has been expended or consumed for national objects. It has been said, that as this debt, or by far the largest part of it, is owing among ourselves, it cannot have any prejudicial action upon the national interest, since that which a body owes to its own members cannot be held in the light of a debt, and may be considered as though it had no existence. It certainly says more for the national resources that its public expenditure, including its debt, has been furnished by its own citizens rather than borrowed from strangers, and that our future industry is therefore not mortgaged to strangers, but that the portion of its fruits which must be set apart for the public creditors will remain at home to afford a fresh stimulus to that industry in time to come. It will nevertheless easily be made apparent how the successive absorption of private capital for public purposes must prove injurious to a country, if we consider what must have been the condition of England, if, instead of thus absorbing a part only, the whole of the disposable wealth of her individual citizens had been so expended. It might still have been said, that as what was taken from all in the form of taxes was returned to a part in the form of dividends, the money did not leave the country; and that although of course it must affect the condition of individuals, it would not affect the condition of the aggregate. But, it must be asked, where, in the case supposed, would have been the capital that must set in motion the springs of industry and enable the payment of taxes? It is indeed evident that in such case the country must have long ago become bankrupt, and have been unable to hold any rank among independent nations.

It is not intended further to pursue the inquiry as to what might have been the result to the nation of any circumstances different from those actually existing, but rather to explain what those actual circumstances are, and to suggest rather than to follow out to their ultimate effects their bearing upon the public prosperity. It seemed necessary however to mention and to combat some of the fallacies by which the question of our public debt is beset, and to show wherein it agrees and on what points it differs in its nature from the debt of an individual. That difference in fact consists in the compound character of the creditors, who as members of the nation are legally and morally bound to contribute towards the maintenance of the public faith, while they have each a personal interest in its preservation. In its practical operation, there is this further distinction to be drawn between the debts of the nation and those of individuals, that the state has at all times the right to pay off its creditors at par, while the latter have no right to demand repayment of the principal money they have advanced, but must content themselves with receiving half-yearly the amount of their annuity.

Before proceeding to give an historical sketch of the progress of the national debt, it may be as well to mention one other fallacy which has been often broached of late years by a small and happily an uninfluential party in the country, namely, that the general prosperity of the state would be advanced by the abolition (unsatisfied) of the public debt; and as in all matters of public policy the prosperity of a great majority should be considered before that of a part, a sound policy requires that faith should no longer be kept with the public creditor. The proposition is here put in plainer terms perhaps than its advocates would use, but this is the substance of their argument.

It has been shown that the money in respect of which the claims of the public creditors have arisen is spent, and that those creditors being part of ourselves, living and expending their incomes among us, the evil effects of the debt are limited to the loss of the capital which otherwise would have formed part of the national wealth, giving additional rewards to industry, and adding in various ways to the sum of our material enjoyments. But the capital thus lost has all been advanced in times of necessity, in full faith that the conditions promised would be performed by the borrowers under all possible circumstances; and it would indeed be a day of disgrace that should sanction the securing of any advantage, however great, through the dishonest breach of those conditions. But would any such advantage as has been supposed follow from so dishonest a step? Those who contend that the great majority of the nation would be benefited by the unsatisfied extinction of the national debt, and would urge its extinction on this ground, as being precisely the same ground on which many enactments are made, ought to show that the loss occasioned by such extinction will be confined to the immediate losers, to the comparatively small number of public creditors. But it is easy to show that the loss would not be confined to the immediate losers; and this being the case, it is impossible to prove that such extinction will really benefit a great

majority. It might happen that it would in its results benefit only a small minority of the actual generation, or even nobody at all; and the allegation of this possible result in a sufficient answer to the assumption made by the advocates of unsatisfied extinction, that the loss incurred would be confined to the immediate losers, and that there would be a real gain to the great majority of the nation. Such an unsatisfied extinction would in effect be a dissolution of innumerable contracts, on the faithful performance of which depends the happiness of many thousands who are not public creditors. It is hardly necessary to remark that the nation would not afterwards find it easy to borrow money from individuals on any reasonable terms for any purpose, however generally useful, or any public necessity, however urgent.

The contracting of the National Debt cannot be said to have been begun before the Revolution of 1688. The kings of England had indeed been accustomed from a remote date to borrow money upon emergencies, but on such occasions the revenues of the crown were pawned for the amount, which was seldom beyond what could by that means be repaid in a few years. The earliest instance of this borrowing which we have on record was in the reign of Richard I., when money was wanted to defray the expense of his crusade to the Holy Land. Even for some few years after the accession of William and Mary the borrowings of the government were for short periods only. The first transaction of this kind of a permanent character arose out of the chartering of the Bank of England in 1693, when its capital of 1,200,000*l.* was lent to the public at 8 per cent. interest. A power of repayment was reserved on this occasion by the crown, but no corresponding right of demanding payment existed on the part of the bank.

So cautious was the parliament in those days of burthening future generations for the exigencies of the present moment, that when the annual income was inadequate to meet the charges of the foreign wars in which the country was engaged, and it became necessary to borrow the deficiency, annuities were granted, not in perpetuity, but for lives and terms of years, the produce of certain duties being mortgaged for their discharge.

This cautious proceeding could not be long continued. The expensiveness of the wars in which the nation was engaged at the end of the seventeenth century made it necessary to incur debts beyond the means of their prompt redemption, and at the peace of Ryswick, in 1697, the debt amounted to 21½ millions. During the next ten years, although the country was again involved in a continental war, its amount was reduced to little more than 16 millions, and the greatest efforts were made to raise money without imposing any lasting burthen on the people. These efforts indeed soon found their limit, and at the accession of George I. in 1714, the debt had accumulated to the amount of 54 millions, an amount which excited great uneasiness and caused the House of Commons to declare itself under the necessity of making efforts for its reduction. In 1717 the debt amounted to 48½ millions, and the annual charge in respect of the same to 3,117,296*l.* A great part of this debt consisted of annuities granted for 99 years, the money obtained for which had varied from 15 to 16 years' purchase.

In the year 1720 the South-Sea Act was passed, authorising the company to take in, by subscription or purchase, the redeemable and unredeemable debts of the nation, the object being to reduce all the debts under one head of account at one uniform rate of interest. In the accomplishment of this scheme the projectors only partially succeeded, while the disgraceful frauds by which the proceedings of the company at that time were marked, led to a parliamentary investigation which caused the disgrace of some of the ministers, the chancellor of the exchequer being expelled the House, and committed to the Tower for his share in the plot. It is not the least remarkable circumstance attending this scheme that it was attempted at the same time with the equally famous Mississippi scheme, which, with a similar object, was projected in France by John Law, under the sanction of the Regent Duke of Orleans. [LAW, JOHN.]

In 1736 the public debt of England amounted to about 50 millions, but the annual charge had been reduced below two millions. At the peace of Aix-la-Chapelle, in 1748, the national debt exceeded 78 millions, but in the following year the public obtained some relief from the burthen through the lowering of the rate of interest. Little else was done in the way of alleviation at this time, and at the breaking out of the Seven Years' War, in 1756, the debt still amounted to 75 millions. A public writer of some repute, Mr. S. Hannay, says, at that date, 'It has been a generally received notion among political arithmeticians, that we may increase our debt to 100,000,000*l.*, but they acknowledge that it must then cease by the debtor becoming bankrupt.' Those who in more recent times have witnessed the addition year after year to the debt of sums equal to more than the difference between its then amount and its declared limit, may smile at this prediction, and learn to put little faith in opinions which are not based upon previous experience.

When the Seven Years' War was ended by the peace of Paris, the debt reached 139 millions and the annual charge was 4,600,000*l.* During the twelve following years, a period of profound peace, only 10,400,000*l.* of the debt was discharged. The war of the American Independence raised the debt from 129 to 268 millions, and the annual charge in respect of the same to 9,512,232*l.* So little was done in the way of liquidation during the following ten years, that at the beginning of the war of the French Revolution the debt still amounted to 260,000,000*l.*, and its annual charge to 9,437,862*l.* The outlay occasioned by the prosecution of that war was great beyond all precedent. Between 1793 and the peace of Amiens the addition made to the capital of the debt amounted to 360 millions and the annual burthen was increased from 9,437,862*l.* to 19,945,624*l.* Between the recommencement of the war in 1803 and its termination after the battle of Waterloo in 1815, there were added 420 millions to the capital of the debt, which then amounted, including the unfunded debt, to 885 millions, and the annual charge upon the public exceeded 32 millions of money. This enormous, this frightful rate of progression, appears to have excited far less alarm than was expressed at the comparatively trifling additions made at the beginning of the funding system, a consequence which probably must be in great part attributed to the establishment of the sinking fund, and to the hope which it held out of cancelling at no very distant period each amount of debt successively increased.

A plan for the gradual extinction of the national debt by the establishment of a sinking fund was proposed and partially applied in 1716 by Sir R. Walpole. The scheme for that purpose proposed under the same name by Mr. Pitt in 1786 had a greater show of reality about it. By this scheme the sum of one million was annually set apart from the income of the country towards the extinction of its debt. Other sums were rendered accessory to the plan, and it was supposed that at the expiration of 28 years the annual income of the sinking fund would amount to four millions, a part of which might then be applied towards relieving the burthen of the public. So far the project bore the stamp of reasonableness and prudence: had the fund of one million annually assigned to commissioners been an actual surplus of income over expenditure, its operation must speedily have been highly advantageous to the country. The fallacy consisted in this, that the sums devoted to it were borrowed for the purpose. The only real advantage secured by this means arose from the unfounded confidence which it imparted to the public, under which they willingly bore a higher rate of taxation than might have been tolerable but for the expectation of future relief through its means. Now that the absurdity is acknowledged of borrowing in order to pay off debt, which absurdity would in the case of an individual always have been apparent, it is difficult to account for the blindness with which the whole nation clung to this so-called fund as the certain means of extinguishing the debt which in effect it contributed to augment through the less advantageous terms upon which the money was borrowed than those upon which an equivalent amount of debt was afterwards redeemed. The difference between the average rates at which money was borrowed and at which purchases were made by the Commissioners who managed the sinking fund between 1793 and 1814 was such, that through the operations of the fund, upon which such confident hope of relief was placed, the country owed upwards of 11 millions more at the end of the war than it would have owed but for those operations. At the period just mentioned the annual income of the sinking fund amounted to 13,400,000*l.*, arising from dividends on stock purchased by the commissioners with funds borrowed at a higher rate of interest for the purpose. It was impossible however during a time of peace to

raise by means of taxes so large an amount, in addition to the actual current expenditure of the country and the interest upon the unredeemed portion of the debt. During the war, when the deficiency of income was covered by yearly loans, the fallacy was not quite so apparent as it now soon became, for a few years after the peace the deficiency in the public income was borrowed from the sinking fund commissioners by parliament, a course which served to render the absurdity only the more apparent, and in 1824 the plan of keeping up a large nominal sinking fund in the absence of actual surplus income was abandoned.

The amount of the National Debt unredeemed on the 5th of January, 1816, was stated to be as follows in the fourth Report of the select committee of the House of Commons on public income and expenditure:—

3 per cent. stock . . .	£580,916,019
3½ " . .	10,740,013
4 " . .	75,725,504
5 " . .	148,930,403
Perpetual annuities	816,311,939
Terminable annuities, 1,894,612*l.*, equal to an estimated capital of	30,080,347
Unfunded debt . .	38,794,038
Total of unredeemed debt .	£885,186,324

The annual charge upon which was:—

Interest upon perpetual annuities . .	£28,278,919
Terminable annuities	1,894,612
Interest on unfunded debt . . .	1,998,937
Charge for management paid Bank of England	284,673
Total annual charge	£32,457,141

The experience of the last twenty-five years has proved that the only important relief from the pressure of debt to be obtained, even during a profound and long-continued peace, will probably be derived from the lowering of the rate of interest. The price of 5 per cent. stock at the beginning of 1822 was advanced to 6 or 8 per cent. above par, and advantage was taken of this circumstance to induce the holders to exchange each 100*l.* of 5 per cent. annuities for 105*l.* of 4 per cent. annuities. On this occasion 140,250,828*l.* of 5 per cent. stock was cancelled, and 147,263,328*l.* of 4 per cent. stock was created, the annual charge being by this means reduced by the sum of 1,122,000*l.* In 1824 a further saving of 381,034*l.* per annum was effected by reducing to 3½ per cent. the interest payable on 76,206,882*l.* of 4 per cent. stock; and in 1830 a further abatement of one-half per cent. was effected on the 4 per cent. stock created in 1822, whereby the sum of 700,000*l.* per annum was saved to the public.

Some little progress has been made since 1816 in the reduction of debt by the employment for that purpose of actual surplus revenue. An addition has on the other hand been made to the public burthens by means of the grant of 20,000,000*l.* voted by parliament for compensation to the owners of slaves in the British colonies who were emancipated by the act of 1833. The unredeemed funded and unfunded debt which existed on the 5th January, 1839, and the annual charge thereon, was as follows:—

3 per cent. annuities . .	£508,360,605
3½ " . .	249,922,566
4 " . .	1,615,385
5 " . .	1,449,134
Perpetual annuities	761,347,690
Terminable annuities, 4,292,173*l.*, equal to an estimated capital of	68,145,907
Unfunded debt . .	24,026,050
Total of unredeemed debt .	£853,519,647

The annual charge upon which was:—

Interest on perpetual annuities . .	£24,135,180
Terminable annuities . . .	4,292,173
Interest on unfunded debt . .	720,928
Charge for management . . .	158,150
Total annual charge	£29,306,431

The diminution of the annual burthen in the course of twenty-three years, from 1816 to 1839, has thus been 3,150,710*l.*, at which rate the total extinction of the debt would not be effected until the year 2053. The slow progress made in this direction stands in striking contrast to the rapidity with which the load was accumulated, the entire diminution effected during twenty-three years of peace being scarcely equal to the additions made during some of the individual years of the war.

It will be seen, on comparing the above statements for 1815 and 1839, that the terminable annuities have increased from 1,894,612*l.* to 4,292,173*l.* By the act 48 Geo. III. and several subsequent acts, the commissioners for the reduction of the National Debt were empowered to grant annuities, either for lives or for certain terms of years, the payment for such annuities being made in equivalent portions of permanent annuities, which were therefore to be given up and cancelled. By this course, which it will be seen has been acted upon to some extent since the peace, some future relief will be obtained at the expense of a present sacrifice. This plan, provided it be not carried so far as to interfere with the onward progress of the country, through an overload of taxation, appears to be dictated by sound prudence. A part of the terminable annuities (nearly one-half their present amount) will expire in 1860, and after that time portions will rapidly fall in; so that without looking to any redemption of debt from surplus income, or to any further reductions in the rate of interest, the next twenty-three years will be productive of nearly as much relief as has been obtained since 1816.

If this course of proceeding is justly characterised as prudent, what must be said of the scheme of a directly opposite tendency which was brought forward and partially carried into effect by the government in 1822? When the measure for commuting the half-pay and pensions usually denominated the 'dead weight' was adopted in that year, the annual charge to which those obligations amounted was about five millions. From year to year the public would have been relieved from a part of this burthen through the falling in of lives, until, according to the most accurate computation, the whole would have ceased in forty-five years. The measure above alluded to was an attempt to commute these diminishing payments into an unvarying annuity of forty-five years certain; and the calculation which was made assumed that by the sale of such a fixed annuity of 2,800,000*l.*, funds might be procured enough to meet the diminishing demands of the claimants. Only a part of this annuity was sold. The Bank of England purchased an annuity, payable half-yearly until 1867, for 585,740*l.*, and paid for the same between 1823 and 1828, in nearly equal quarterly instalments, the sum of 13,089,419*l.* For the sake of obtaining a partial relief during those six years, to the amount of 9¼ millions, we have thus had fixed upon the country for thirty-nine subsequent years an annual payment of 585,740*l.* It is not possible to allow that both these courses, so directly opposed to each other, could have been wise. Without inquiring further into the matter, it may be said that the plan of taking a larger burthen upon ourselves, that we may relieve those who come after us, has at least the recommendation of being the most generous; and considering that our successors will have had no hand in the contracting of the debts, the burthen of which they will have to bear, it might also be said that such a course is the most just.

It will be seen that some saving has been effected between 1816 and 1839 in the charges of management. This saving was part of the bargain made by the government with the Bank of England on the renewal of its charter in 1833, and may be considered as a part of the price paid by that establishment for the prolongation of certain of its privileges then on the point of expiring. The system employed for the management of the public debt by that corporation is explained elsewhere in this work. [Bank, Banker, Banking.] The functions intrusted to the Bank of England with reference to the National Debt do not extend to the transaction of any matter connected with its reduction. Such business is placed under the control of a body of commissioners, who act *ex officio* under the provisions of an act of parliament. This board is composed of the speaker of the House of Commons, the chancellor of the exchequer, the master of the rolls, the lord-chief-baron of the Court of Exchequer, the accountant-general of the Court of Chancery, and the governor and deputy-governor of the Bank of England. The greater part of these commissioners do not take any part in the management of the

business, the details of which are attended to by permanent officers, viz. a secretary and comptroller-general, and an actuary, with an adequate establishment of assistants and clerks: the ultimate control is exercised by the chancellor of the exchequer for the time being, assisted by the governor and deputy-governor of the Bank of England.

NATIONAL GALLERY. Of the origin of this public collection of paintings mention has already been made at the end of the article on the British Museum. Previously to the purchase of the Angerstein pictures, the gallery at Dulwich was almost the only one in the whole country, excepting the royal collections at Windsor and Hampton Court, to which the public had anything like free if not gratuitous access; for wealthy as England is in master-pieces of painting, they are dispersed through a great number of private galleries and cabinets, to which, if access is to be had at all, it is only occasionally. Consequently those stores of art have had little influence upon our national taste, but the public generally have been left to pick up their acquaintance with art at our annual exhibitions, where of course there is always a great preponderance of mediocrity. The exhibitions of the works of the old masters at the British Institution constituted almost the only opportunity of seeing works of that class which was afforded to artists and the public. Still, however desirable in themselves, such temporary exhibitions were insufficient. Hitherto government had scarcely ever done anything directly for art; and if it was to do so at all, no better beginning could be made than by securing for the nation the Angerstein collection, it being, although not very extensive, of choice quality, and containing some first-rate specimens. For the Sebastian del Piombo alone 20,000*l.* had been offered (by Mr. Beckford) and refused; therefore, 57,000*l.* for the whole was by no means an extravagant price, particularly if compared with what has since been given for single paintings, namely, 5000*l.* for Titian's Bacchus and Ariadne; 3800*l.* for the Virgin *au Panier*, by Correggio; 11,500*l.* for the two larger specimens of the same master (the Ecce Homo and the Education of Cupid), sold to the Gallery in 1834 by the marquis of Londonderry; and about 4000*l.* for Raphael's St. Catherine, a single half-length figure.

The original collection consisted of about forty pictures, chiefly of the Italian school, but is now (1839) augmented to more than treble that number, by purchases, donations, and bequests. The directors of the British Institution have liberally presented at different times five works, namely, the Parmegiano and Paul Veronese, and three specimens of the English school, Reynolds's Holy Family, Gainsborough's Market-Cart, and West's large picture of Christ healing the Sick. Sir George Beaumont's noble gift of his collection, in 1826, enriched the Gallery soon after its establishment with several choice specimens, particularly in the department of landscape, with the very fine one by Rubens, four Claudes, and two Wilsons: the others are, a Descent from the Cross (sketch) by Rembrandt, the portrait of a Jew, by the same master, a landscape by Both, West's Pylades and Orestes, and Wilkie's Blind Fiddler. The bequest of the Rev. William Holwell Carr constituted a very numerous and important accession of works of the Italian school, besides some others, as will appear from the following list:—Lionardo da Vinci—Christ disputing with the Doctors in the Temple; Michael Angelo's Dream; Andrea del Sarto—a Holy Family; Bronzino—a female portrait; Garofalo—Vision of St. Augustin; Giulio Romano—a Charity; Titian—an Adoration of the Shepherds; Sebastian del Piombo—Portrait of Cardinal Hippolito de' Medici, and another, supposed to be that of Giulia Gonzaga; Tintoretto—St. George; Paul Veronese—Europa; Domenichino—Tobias and the Angel; Ditto—Landscape, with St. George and the Dragon; Guercino—a Christ and two Angels; Claude—Landscape, with the story of Sinon; Gaspar Poussin—three landscapes, one of them with the Adventure of Dido and Æneas; Rubens—St. Bavon relieving the Poor; Rembrandt—a landscape, with Tobias and the Angel; also a female wading through a stream, which last, though disagreeable as a subject, is for its execution a superior specimen of that master.

Among other donations the principal are the two Guidos, Perseus and Andromeda, and Venus attired by the Graces, presented by William IV.; the allegorical subject, by Rubens, entitled Peace and War, given by the late duke of Sutherland; the two Cartoons, by Annibale Caracci, the gift of Lord Francis Egerton; and the picture representing the story of Phineus, presented by Lieutenant-general Thornton, called in the catalogue a Poussin, but asserted by some to be the production of Romanelli. The most considerable of the later bequests is that of Lord Farnborough, which has added fifteen pictures to the Gallery, nearly all by Flemish and Dutch artists, including three by Teniers and two by Vandervelde; therefore furnishing specimens of that school, of which there were previously scarcely any, excepting those of Rubens and Rembrandt. The same number of paintings have been bequeathed by Lieutenant-colonel Harvey Ollney, most of which also belong to the above school, except four small ones, originally described as Watteau's, but now recognised as being by Lancret, an inferior artist.

From the great increase which has thus taken place within the course of a very few years, there is room for supposing that the liberality of private possessors will in time augment the collection very materially; still, if it be desirable on the one hand that such disposition should be encouraged, it is equally necessary on the other to guard against the indiscriminate acceptance of whatever may be gratuitously offered; since if due regard be not had to quality, the character of the entire collection will be endangered by the influx of mediocre and indifferent works, inferior specimens of the masters whose names they bear. The three pictures, for instance, presented by the duke of Northumberland are certainly not of that rank which would have procured their admission into the original Angerstein collection. It has also been complained that sufficient discretion has not been exercised with respect to purchases; for while extravagant sums have been paid in some instances, many works of equal or even greater merit have been rejected, although offered at reasonable prices. 'No specified sum is placed at the disposal of the trustees every year; but if any work of art is strongly recommended, a memorial must be sent to the Treasury, which is followed up by an application for the amount to parliament: the delay and the system effectually prevent merchants and others from negotiating with the trustees, as the doubt and perplexity are not to be compensated by the price demanded. In some instances pictures of the highest quality have been peremptorily refused, for what reasons we are unable to say. Two of the finest works by Salvator Rosa (Diogenes casting away his Cup, and Heraclitus sitting among the remnants of Mortality) were offered by the earl of Lauderdale, on the part of the late dowager-marchioness of Lansdowne, and refused: the individual who had the chief voice in rejecting them afterwards purchased them for the marquis of Westminster, for 1400*l.* If they were worthy to be placed in the Grosvenor Gallery, they would have been ornaments to the national collection.' (*Brit. and For. Rev.*, No. 17, 'Works of Art, &c. in England.') The writer just quoted asserts that the prices of all the subsequent purchases after that of the first collection have been extravagant, with the exception of those for the two Londonderry Correggios and the Murillo (the Holy Family), added to the Gallery in 1837. The three pictures more recently purchased of Mr. Beckford, viz. the Raphael (St. Catherine), the Garofalo, and the Perruzzi, originally cost that gentleman 3628*l.*, but have cost the nation 7000*l.*, or nearly double that sum, a price greatly disproportionate to their worth; which may also be said of that given for the Titian (Bacchus and Ariadne), purchased of Mr. Hamlet for 5000*l.* The same authority further assures us that, besides the instances above given, several opportunities of obtaining superior specimens at very moderate rates have been very inconsiderately neglected, in consequence of which many fine pictures, that might have been procured for the Gallery at a much lower cost than some of inferior rank have been, have either been sent out of the country or disposed of to private collectors. Among them was a fine specimen of Guercino (the Beheading of St. Catherine), purchased by Mr. Higginson for 350*l.*; a Bellini, Carlo Dolce, and a Correggio (greatly superior, it is stated, to the Virgin *au Panier* in the Gallery), which, with another picture, were sold to Mr. Wynne Ellis for only 1200*l.*, though the Correggio alone was worth double that amount. Again, an exceedingly fine work by Bonefaccio (the Adoration of the Magi), almost equal to Titian, might have been had for the inconsiderable price of 200*l.* It further appears that notwithstanding the exceedingly large sums they have cost, some of the pictures are not in that high condition which they ought to be. The Correggio (Virgin *au Panier*) has suffered very materially, and the Raphael (St. Catherine) has undergone much repairing by

stippling in the flesh parts. Even the Raising of Lazarus, by Sebastian del Piombo, had in some places been damaged by time, but were so finely restored by West as almost to defy detection. With regard to the authenticity of some of the pictures there is also considerable doubt: Dr. Waagen pronounces the Lionardo da Vinci to be not by that master, but by Bernardino Luini; while, according to the writer in the 'British and Foreign Review,' it is by Andrea Solario; nor is the subject Christ disputing in the Temple with the Doctors, but Joseph interpreting Pharaoh's dream. Again, though so assigned in the catalogue, the story of Phineus is not by Niccolo Poussin, but Romanelli.

The following is a numerical synopsis of the collection at present (1839), arranged according to the principal schools:—

Italian:—Baroccio, 1; L. Bassano, 1; Bronzino, 1; A. Caracci, 9; L. Caracci, 3; Claude, 10; Correggio, 4; Canaletto, 3; Domenichino, 4; Ercole da Ferrara, 1; Mazzolino da Ferrara, 1; Garofalo, 1; Giorgione, 1; Guercino, 1; Guido, 3; Michael Angelo, 1; Mola, 3; Paduanino, 1; Parmegiano, 1; Pannini, 1; S. del Piombo, 3; N. Poussin, 8; G. Poussin, 6; Raphael, 2; Giul. Romano, 1; Sal. Rosa, 1; A. del Sarto, 1; Titian, 5; Tintoretto, 1; A. Veronese, 1; P. Veronese, 2; Da Vinci, 1:—(85). *Spanish*:—Murillo, 2; Velasquez, 1. *Flemish and Dutch*:—Both, 1; Cuyp, 1; Decker, 1; Van Goyen, 1; Van der Helst, 2; Jordaens, 1; Maes, 2; Van der Neer, 1; Pether, 1; Rembrandt, 7; Rubens, 7; Storck, 1; Steinwick, 1; Vandervelde, 2; Vandyck, 4:—(33). *French*:—S. Bourdon, 1; Lancret, 4. *English*:—Beaumont, 2; Beechey, 1; Constable, 1; Copley, 1; Gainsborough, 2; Hogarth, 7; Hoppner, 1; Housman, 1; Jackson, 1; A. Kauffmann, 1; Lawrence, 4; Reynolds, 8; West, 4; Wilkie, 2; Wilson, 2:—(38).

The specimens of the English school are far from numerous, and some of them by no means *chefs-d'œuvre* of the artists to whom they belong; but it is to be hoped that the Gallery will in time deserve the epithet of National, by exhibiting proofs of native and national talent. It would be well therefore if, by the occasional purchase of the finest productions of living talent, our artists were incited to apply themselves to works of higher aim and more sterling character than are required for distinction at an exhibition-room, and to look forward to a place in the Gallery as to a monumental niche in the temple of Fame. It will however soon become necessary to consider how space is to be provided for fresh acquisitions, since, although the collection can even now be considered only as the nucleus of what it eventually will and ought to become, the increase has been such that the portion of the building allotted to the Gallery is already filled with as many pictures as it can properly contain, since it consists of no more than five rooms altogether, and two of them of very moderate dimensions.

This brings us to speak of the edifice itself, which has been more severely and more illiberally censured, both for its external appearance and interior accommodation, than almost any other architectural work. In either respect it is undoubtedly very far from what it ought to be; yet although the censure has fallen almost entirely upon the architect alone, many of the defects complained of were forced upon him by the inconveniences attending the site, and other unfortunate circumstances, and it is therefore very doubtful whether, fettered by the same untoward conditions, any one else would have been able to do much better, at least as far as accommodation is concerned. Not only was the plan restricted to an inconveniently narrow slip of ground, but the alleged, yet by no means apparent, necessity of keeping as public thoroughfares two passages through the lower part of the building, has caused the ground-floor to be so divided that should occasion for so doing arise, it will be found impossible to form a spacious gallery of any kind, either for sculpture or paintings, in that part of the building. Again, the necessity for providing two distinct entrances and staircases, without the means of projecting out the latter at the rear of the building, has unavoidably caused all the centre portion, amounting to about one-third of the interior, to be so appropriated, which of course seems a very great loss of space, although the same space would not have been at all extravagant if the Gallery itself had been in proportion to it. Such a building as St. Martin's workhouse ought never to have been allowed to be any obstacle in the way of a suitable plan for the Gallery, more especially as it could easily be foreseen that though the accommodation at first provided might be amply sufficient, the time would arrive when it would be found altogether inadequate. Consequently what is now erected should have been understood to be only provisional, and Mr. Wilkins should have been instructed to have formed his plans with the view of the building being extended northwards, both at its east and west ends. How additions may be made is shown in one of the plans of the Gallery accompanying the 'Report from the Select Committee of Arts,' &c., viz. by continuing the present suite of rooms westward, at the rear of the houses on the north side of Pall-Mall East, where there might be a building upwards of 100 feet square, enclosing an inner court. But were government to give up the site of the adjacent barracks, the plan might be much more extensively enlarged, as there would then be space for erecting, in continuation of the present edifice, a series of galleries upwards of 300 feet in length, by nearly 200 in depth, which would give a line equal to about 1000 feet, doubled by the walls on each side. Even this might be still further extended by building other galleries intersecting the square or quadrangle enclosed by the outer ones; for supposing these latter 30 feet wide, they would leave an internal space or court 200 feet one way and 100 the other. (*Public Buildings of London*, by W. H. Leeds, vol. ii.)

There may be difficulties, but surely not insuperable ones attending the scheme here proposed, which while it would provide sufficiently numerous and spacious galleries, that would lose nothing of their effect by being approached through the present rooms, would be recommended by economy, because all such additional buildings would be entirely shut out from view externally, and therefore require no finish or regard to design on their outside. The increase of space so obtained would, besides, be double what is above stated, since that refers only to the upper floor, whereas there would be equal additional extent gained beneath it; which might be appropriated to a gallery of modern sculpture, there being nothing of the kind at the British Museum. Such a plan might be carried on by degrees, a single room or gallery on each floor being erected as it should become necessary to do so; and some classification as to schools, and also subjects and sizes, might be observed, which, if not of much importance at present, will require to be attended to when the collection shall have become much more numerous. There would then be opportunity for introducing in such new galleries that greater attention to architectural splendour and decoration which the public seem to demand; for almost every one has spoken most contemptuously of the present rooms, not only as insufficient in size, but as mean in appearance. One writer calls them 'little poking boxes,' another ('Br. and For. Rev.') says, 'they are beneath contempt: they display neither grandeur nor style.' Undoubtedly not, but then neither does anything of the sort appear to have been contemplated; and, at all events, the architect is not to be reproached for not having attempted more than he was allowed to perform. The architecture of the rooms is quite subordinate, almost negative; there is nothing whatever in them to please as mere architecture, nor is there anything whatever to offend; while the principal object, that of showing the pictures, has been satisfactorily accomplished.

The exterior of the building has been criticised, or rather summarily condemned, with equal severity; and without any allowance being made for the difficulty thrown in the architect's way by his being under the necessity of making use of the columns formerly belonging to the portico of Carlton House. This seems to have cramped his design by limiting him as to the height of his portico, which he would else most probably have rendered a far more imposing and dignified feature by employing for it an order of larger dimensions, rising above the general height of the elevation as in the façade of the London University College; and had he done so, bestowing on that order a richer entablature than on the rest, together with a rather loftier pediment enriched with sculpture, and with statues on its acroteria, the dome, which is more of a blemish than an ornament in the design, might have been dispensed with, as the centre would have been sufficiently and more effectively distinguished, by its greater loftiness, without it. The entire extent of front is 460 feet, but this length is too much broken up into separate parts, and more so than would else probably have been done, it being required of the architect to set back the extremities in order that the east end of his

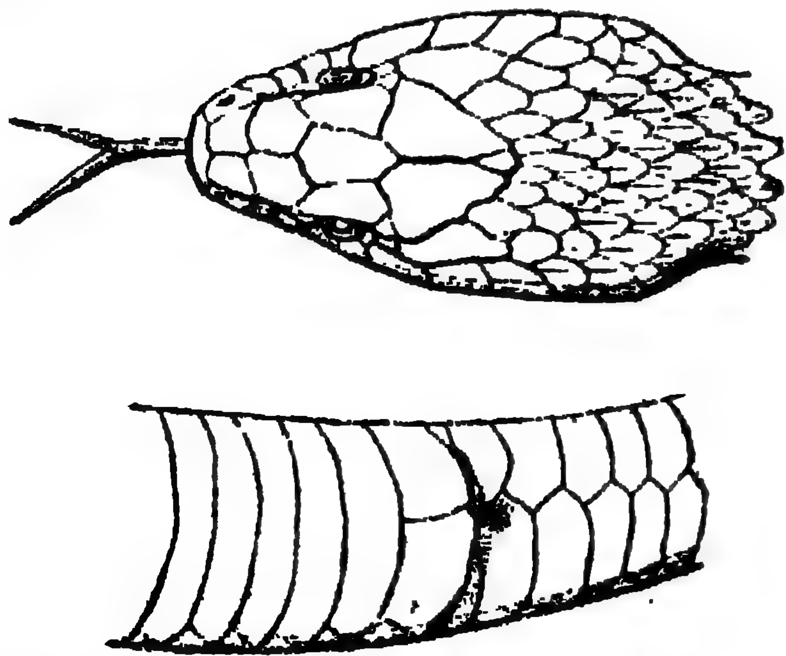
building should not at all intercept the view of the portico of St. Martin's from Pall-Mall East; whereas had he been allowed to bring those parts as forward as the background of his portico, very much more space would have been obtained internally, and the end facing the church, which is now a very narrow and insignificant-looking bit, would have been considerably augmented. It is to be regretted, too, that the small windows at the sides of the entrances to the two thoroughfares were not got rid off, by being turned towards those passages; and perhaps a little more study and contrivance would have enabled the architect to dispense with those in that division of the façade from which the portico projects, and where they sadly cut up that mass. At all events, there would have been no difficulty whatever in entirely concealing the windows in the basement story, by merely continuing the podium as a low screen before them, with breaks forming pedestals for statues at intervals. By that means a deformity would have been got rid off, the ordinary dwelling-house look attending those kitchen-windows have been avoided, and an air of nobleness and richness, with some degree of novelty of design also, have been imparted to the whole façade. It is true, the rooms in the offices below would not have commanded the view they now do, yet that is a very minor consideration, and ought not to have been allowed to stand in the way of its being done. Fortunately however for such improvement it is even now not too late, since it may be carried into effect at any time without the slightest trouble or inconvenience. So also may the now empty niches be filled with statues; but there is no hope that anything will ever be done to remedy one prevalent and very serious defect, namely, the excessive poverty of the whole entablature, which renders it not only at variance with the richness of the columns, but insignificant in the general effect, whereas even some little exaggeration with respect to the depth of its members would have been allowable, if merely because a little more height might thus have been given. Notwithstanding these and other defects, some of which appear to have been forced upon the architect, there is much beauty in particular parts, especially the portico: but for further criticism on the building we must refer to the work above quoted, where elevations and plains of it will also be found. Plans of it have also been given in the 'Companion to the Almanac for 1837,' and the 'Penny Magazine,' No. 299. The latter publication also contains (Nos. 8, 12, 24, and 47) notices of some of the principal pictures. The building was begun in 1833 from the designs of W. Wilkins, R.A. (died August 31, 1839), and completed in 1837; and the first exhibition of the Royal Academy within its walls took place in 1838.

NATIONS, LAW OF. [LAW, p. 361.]

NATO'LIA. [ANATOLIA.]

NATRIX, Laurenti's name for a genus of *Colubridæ*, a family of snakes destitute of poison-fangs, and of which the common snake, *Natrix torquata* of Ray, may be taken as the example.

Generic Character.—Head distinct, oblong-ovate, depressed, covered with scuta; gape wide, body very long, nearly cylindrical, slender, scales imbricated, placed in longitudinal series, lanceolate, generally carinated, abdominal shields simple, arched at the margin, caudal shields biserial. (Bell.)



Head and tail of Natrix. Head seen from above; tail from below.

The *Common* or *Ringed Snake* is too well known to require description: the female is larger than the male. Its food consists of lizards, young birds, birds' eggs, mice, and more particularly frogs. The latter are generally captured by one of the hind legs, and in that case the prey is swallowed alive, and with the lower limbs and parts foremost, the head still continuing in its proper position, and disappearing last. During the operation of deglutition the cries of the frog are very distressing, and we have delivered more than one from its enemy—unfairly perhaps, in consequence of being attracted by the cries of the sufferer. The frog evidently remains alive for some time after it has been swallowed, in the course of which the jaws are dilated, and, so to speak, dislocated in order to allow of the passage of the disproportioned body to be conveyed into the stomach. Mr. Bell, who gives in his 'British Reptiles' a very accurate and clear account of the manner in which this operation is performed and the dilatation effected, states that he has heard a frog distinctly utter its peculiar cry several minutes after it had been swallowed by the snake. The same zoologist observes that the frog is generally taken by one of the hinder extremities, because the latter is most frequently in the act of fleeing from its pursuer when taken; and in that case, the prey, according to his experience, is swallowed as we have above described; but he adds, that if the frog be taken by the middle of the body, the snake invariably turns it by several movements of the jaws, until the head is directed towards the throat of the snake, when it is swallowed head-foremost. In taking lizards or birds, the snake, as far as Mr. Bell's observation goes, always swallows them head first. The same author gives a curious but painful description of an instance where two snakes had seized the same wretched frog, which, after a long and painful struggle, and some fighting between the snakes, was swallowed by the victor.

When the skin of the common snake has been just cast, it is a very beautiful serpent, and those who have seen it, as we have, gracefully swimming with elevated head and neck, and with the sun shining on its 'enamelled skin,' as it crossed the limpid water of some clear stream or little lake, will acknowledge its elegance and beauty. Mr. Bell has the following observations upon the subject of this change of the skin, which, as some misapprehension has existed on the subject, we proceed to lay before our readers. 'Snakes, like most other reptilia, shed their cuticle or outer skin at greater or less intervals. It is a mistake to assign a particular period to this process; some have stated it to occur once, some twice in the summer; but I have found it to depend upon the temperature of the atmosphere, and on the state of health, and the more or less frequent feeding of the animal. I have known the skin shed four or five times during the year. It is always thrown off by reversing it; so that the transparent covering of the eyes, and that of the scales also, are always found in the exuviæ. Previously to this curious circumstance taking place, the whole cuticle becomes somewhat opaque, the eyes are dim, and the animal is evidently blind. It also becomes more or less inactive, until at length, when the skin is ready to be removed, being everywhere detached, and the new skin perfectly hard underneath, the animal bursts it at the neck, and creeping through some dense herbage, or low brushwood, leaves it attached, and comes forth in far brighter and clearer colours than before.'

White and others have remarked an offensive power in this creature, that of 'stinking se defendendo,' as White describes it. He adds, 'I knew a gentleman who kept a tame snake, which was in its person as sweet as any animal while in good humour and unalarmed; but as soon as a stranger or a dog or cat came in, it fell to hissing, and filled the room with such nauseous effluvia as rendered it hardly supportable.' But this offensive odour, which is expelled from certain glands, is not emitted in self-defence alone. It is also said to be the concomitant of sexual excitement.

Reproduction.—Oviparous, as in the rest of the genus. The eggs, to the number of sixteen or twenty, are deposited in a connected chain in some dung-heap or warm situation, the connection being effected by a glutinous substance, and there left till the heat of the place or of the sun calls the young into life. In the museum of the Royal College of Surgeons (*Physiological Series*, No. 2708) is a preparation of a species of coluber, in which the ova in the ovaria are in an advanced state of development; the ovisac nearest the expanded anterior orifice of the left oviduct is near the period of discharging its contained ovum, and the longitudinal line is discernible, which indicates the place of the future rent by which it would have escaped. The cloaca is laid open; a bristle is placed in the termination of the rectum, behind which may be observed the semilunar fissure

in which the oviducts terminate, and the bilobed prominence on which the ureters open. No. 2417 (the first illustration of the Ametabolian subclass, in which copulation is attended with intromission) exhibits the posterior part of the body of the *Common Snake* with the ventral integuments dissected off from the abdomen and tail, to show the testes and two penes *in situ*. The testes are small, slightly compressed, oblong bodies, situated anterior to the kidneys, the right about an inch in advance of the left, corresponding to the difference in the relative position of the kidneys; the penes, which consist almost wholly of a præputium or invertible sheath, and a small glans, are retracted within their subcaudal cells; bristles are inserted into the outlets of these receptacles, and pass into the cavities of the inverted præputia. The muscles which retract the penes and invert the sheaths are exposed as they pass backwards to their origins from the inferior spines of the caudal vertebræ. No. 2418 exhibits the termination of the abdomen and tail of a large *Coluber*, also prepared to show the male sexual organs. (*Catalogue*, vol. iv.)

Habits, &c.—The common snake commences its hybernation in some warm hedge, under the root of a tree, or other sheltered situation, about the end of autumn; and then they coil themselves up, sometimes in numbers, till the spring again brings them forth. Many instances of tame snakes have been recorded, and more than one has come under our immediate observation. Mr. Bell gives the following account, showing that these snakes may be made to distinguish those who caress and feed them. 'I had one many years since, which knew me from all other persons; and when let out of his box would immediately come to me, and crawl under the sleeve of my coat, where he was fond of lying perfectly still, and enjoying the warmth. He was accustomed to come to my hand for a draught of milk every morning at breakfast, which he always did of his own accord, but he would fly from strangers and hiss if they meddled with him.'

The following are the synonyms collected by the last-mentioned author: — *Natrix torquata*, Ray, Fleming, Jenyns, Bonaparte. *Coluber Natrix*, Linn., Shaw, Daudin, Turton. *Coluber torquatus*, Lacépède; *Natrix vulgaris*, Laurenti. *Tropidonotus Natrix*, Kuhl, Gray. *Ringed Snake*, Pennant. *Couleuvre à Collier*, Lacépède. It is the *Ringelnatter* of the Germans, and *Tomt-Orm*, *Snok*, and *Ring-Orm* of the *Fauna Suecica*.

The editor of the last edition of Pennant's 'British Zoology,' the Rev. L. Jenyns, and Mr. Bell, are all of opinion that the *Dumfriesshire Snake* of Sowerby's 'British Miscellany' is probably an immature variety of this species. The editor of Pennant seems however to be in doubt whether it is the young of the *Aberdeen Snake*, *Anguis Eryx*, or of the Natrix here treated of. But there can, we apprehend, be hardly any doubt that the Dumfriesshire Snake is the young of *Natrix torquata*. The *Aberdeen Snake* is nothing more than the *Slow-worm* or *Blind-worm*. [BLIND-WORM.]

Geographical Distribution.—Europe, 'from Scotland and the corresponding latitude of the Continent, to Italy and Sicily.' (Bell.)

With reference to the alleged inability of reptiles to live in Ireland, Mr. Bell says, 'I have already mentioned the existence of *Lacerta agilis* there, and with respect to the present species, the following is the result of my inquiries. It would appear not only that the common Snake is not indigenous to Ireland, but that several attempts to introduce it have totally failed. Mr. Ball some time since informed me of some trials of this kind.' Mr. Bell then prints the following letter from Mr. Thompson, which he had recently received, and which, as Mr. Bell observes, gives a very detailed and clear account of the actual facts.

'In this order (*Ophidia*) there is not now, nor, I believe, ever was there, any species indigenous to Ireland. In the Edinburgh "New Philosophical Journal," for April, 1835, it is remarked: "We have learned from good authority that a recent importation of snakes has been made into Ireland, and that at present they are multiplying rapidly within a few miles of the tomb of St. Patrick." I never,' proceeds Mr. Thompson, 'heard of this circumstance until it was published, and subsequently endeavoured to ascertain its truth, by inquiring of the persons about Downpatrick (where the tomb of St. Patrick is) who are best acquainted with these subjects, not one of whom had ever heard of snakes being in the neighbourhood. Recollecting that about the year 1831, a snake (*Natrix torquata*), immediately after being killed at Milecross, was brought by some country-people in great consternation to my friend Dr. J. L. Drummond, I thought this might be one of those alluded to; and recently made inquiry of James Clealand, Esq. of Ruth Gael House (county Down), twenty-five miles distant in a direct line from Downpatrick, respecting snakes said to have been turned out by him. I was favoured by that gentleman with the following satisfactory reply:—" The report of my having introduced snakes into this country is correct. Being curious to ascertain whether the climate of Ireland was destructive to that class of reptiles, about six years ago I purchased half a dozen of them in Covent Garden market in London; they had been taken some time, and were quite tame and familiar. I turned them out in my garden; they immediately rambled away; one of them was killed at Milecross,"—that alluded to as having been brought to Dr. Drummond,—" three miles distant, in about a week after its liberation; and three others were shortly afterwards killed within that distance of the place where they were turned out; and it is highly probable that the remaining two met with a similar fate, falling victims to a reward which it appears was offered for their destruction." '

To this Mr. Bell adds, that it certainly does not appear that the failure of these attempts to introduce snakes into Ireland is to be attributed to anything connected with the climate, or other local circumstances, but rather to the prejudices of the inhabitants; nor is there reason to believe that their absence from Ireland is other than purely accidental. (*British Reptiles.*)



Natrix torquata: Common or Ringed Snake.

NATROLITE. [MESOTYPE.]

NATRON, native sesquicarbonate of soda. [SODIUM.]

NATRON LAKES are in a valley in the western desert which borders upon Lower Egypt running south-east and north-west between the calcareous ridge that skirts the western edge of the Delta and another parallel range which divides it from the BAHR-BELA-MA. The Natron valley contains six lakes, remarkable for the great quantity of salt which they produce. The crystallizations are both of muriate of soda, or common salt, and of carbonate of soda, called natron or trona. The lakes are ranged in succession along the length of the valley, being separated from each other by barren sands; the whole occupy a length of about sixteen miles. The size of the respective lakes varies according to the season, and they are very shallow; the bottom is muddy, of mixed sand and clay. The lakes are supplied by water, which oozes out of the banks, chiefly on the side which is towards the Nile. It appears that the water flows abundantly when the Nile is high, and decreases with its decrease, until some of the lakes become quite dry. The banks of the lakes below the springs are covered with crystallizations. The natron is collected once a year, and is used both in Egypt and Syria, as also in Europe, for manufacturing glass and soap, and for bleaching linen.

There are three or four convents in the valley of the Natron lakes; their foundation is said to date from the fourth century of our æra; they are inhabited by Copt and Syrian monks, who are very poor and very ignorant. The valley itself is a barren desert.

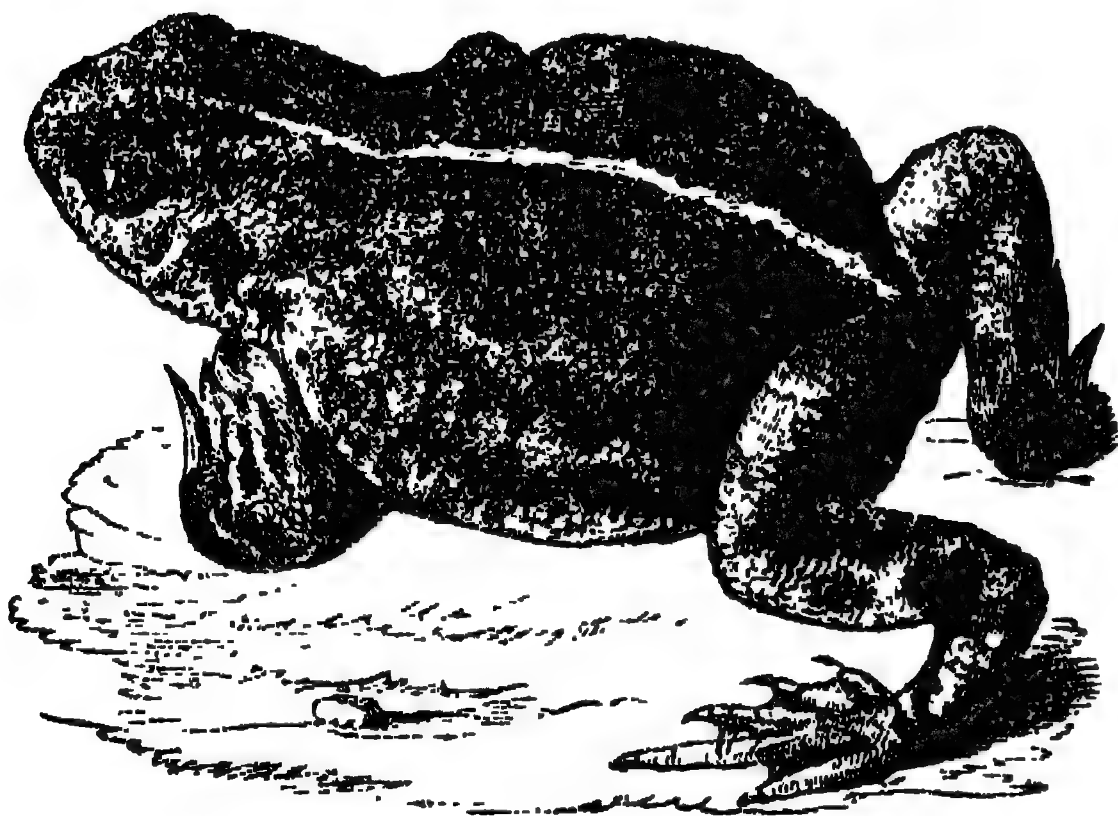
(Andreossi, *Mémoire sur la Vallée des Lacs de Natron.*)

NATTER-JACK, or **NATTER-JACK TOAD,** the English name for the *Bufo Calamita* of Laurenti. Its colour is light-yellowish inclining to brown and clouded with dull olive; but its most distinguishing mark is the bright-yellow line running along the middle of the back. The warts or glands on the body and the large glands behind the head are reddish; the under parts yellowish spotted with black, and the legs banded with black.

Sir Joseph Banks was the first who drew Pennant's attention to it as a British species: and the latter notices it as frequenting dry and sandy places, and as having been found on Putney Common and also near Revesby Abbey in Lincolnshire. The Rev. L. Jenyns records it as occurring in plenty on many of the heaths about London, as well as on Gamlingay Heath in Cambridgeshire, and in two or three localities in Norfolk. Mr. Bell (*British Reptiles*) states that he has found them in considerable numbers near ponds and ditches not far from Deptford, where they appeared to have congregated for the purpose of breeding. He observes that Dr. Fleming was not apparently aware of its being an inhabitant of Scotland, but Sir W. Jardine informed Mr. Bell that it is 'taken in a marsh on the coasts of the Solway Frith, almost brackish (certainly so in winter), and within a hundred yards of spring-tide high-water mark. It lies,' continues Sir William, 'between the village of Carse and Saturness (Southerness) Point, where I have found them for six or seven miles along the coast. They are very abundant.' The specimens sent to Mr. Bell by Sir W. Jardine were in every respect the same as those found in the neighbourhood of London. We long ago saw them frequently at Hillingdon near Uxbridge (Middlesex).

Pennant well describes the movements of the Natter-Jack. 'It never leaps, neither does it crawl with the slow pace of a toad, but its motion is more like running.' He says that its deep and hollow voice is heard to a great distance. Mr. Jenyns states that it spawns later in the season than the common toad. Mr. Bell gives the following dimensions:—

	Inches.	Lines.
Total length . .	2	8
Length of fore leg .	1	3
Length of hinder leg	2	2



Natter-Jack.

NATURAL, a musical character, thus formed·

the use of which is, to make a sharpened note a semitone lower, and a flattened note a semitone higher; or, in other words, it brings into the scale of the natural key of C any note which had been made sharp or flat. But it must be observed, that the power of this character does not extend beyond the bar in which it appears, except where a lasting change of key is intended, in which case each natural placed at the clef removes a corresponding sharp or flat permanently, or until such sharp or flat shall be restored in like manner.

NATURAL ORDERS OF PLANTS. In classifying the vegetable kingdom according to the affinities of the species, it has been found necessary to collect together into groups such genera as have more resemblance to each other than they have to anything else, and to these the name of natural orders has been given. They constitute the foundation of all arrangements, and are wholly independent of the peculiar views which different writers have taken of the manner in which the vegetable kingdom should be otherwise classified; thus, while one author advocates the propriety of arranging Exogens by the modifications of their corolla, another by the insertion of their stamens, a third by what is supposed to be the progressive order of their development, and so on, the result of each of which methods is a different sequence of matter, the natural orders themselves remain unchanged. This being so, the study of their true limitation, and of the characters by which they are essentially distinguished, constitutes by far the most important branch of systematical botany, and accordingly we find that a large proportion of the natural orders yet founded are admitted without much difference of opinion. It must be obvious also to any one at all acquainted with such subjects, that in many cases there is in fact no room for discussion; as in the Apiaceous, Asteraceous, and Brassicaceous orders, or in Grasses, Sedges, and Orchidaceæ.

It is however sufficiently singular, that notwithstanding the general accordance of opinion that may be said to exist upon this subject in the majority of cases, no one should, as yet, have undertaken to prove what are really the essential characters by which natural orders ought to be distinguished, and what are unimportant or inapplicable to the limitation of such groups. In the absence of a settlement of this point, all that has yet been effected is, in its very nature, arbitrary and unsatisfactory, notwithstanding that it does appear to be, to a great extent, right: and there is an inconsistency and want of harmony in the different divisions of the natural system, which is most perplexing to the student. Up to the present time botanists have occupied themselves much more with searching for differences by which genera may be divided, than for resemblances by which they may be combined, a state of things which has proved advantageous to the science of botanical classification in its infancy, but which, if not corrected, will prevent its ever attaining maturity.

It is probable that such characters as the number of parts, the regularity or irregularity of flowers, the insertion of stamens, direction of ovules, and the presence or absence of particular organs, all which are at present considered of great importance, are so far from serving to separate plants into different orders, that they may be mere indications of a peculiar state of development in plants of the same order. Such orders as Myrtaceæ and Onagraceæ serve to place this in a striking point of view. In Myrtaceæ the stamens vary from an indefinite number in Myrtus to only 5 in the genus Bæckea; and from being polyadelphous in Calothamnus, to being distinct in Myrtus itself; the flowers are polypetalous in Myrtus, and apetalous in Eucalyptus; regular in the mass of the order, but irregular in Lecythis and its allies; the ovary is many-celled and many-seeded in Leptospermum, and one-celled with two seeds in Calytrix; altogether inferior in Eugenia, &c., and superior in the whole of the Leptospermeous division. In like manner in Onagraceæ, Œnothera has 8 stamens, and Hippuris one only; the flowers are polypetalous in the mass of the order, but apetalous in some Fuchsias; regular in the mass of the order, but irregular in Chamænerium; and the ovary is 2- or 4-celled in the greater number of genera, but 1-celled in Trapa, and in some plants referred to Haloragis. So, in like manner, is the position of the ovule within the ovary a character liable to much variation; for instance, among Urticaceæ, it is erect in Urtica, and pendulous in Dorstenia and Humulus; among Myrtaceæ, it is erect in Verticordia, peltate in Beaufortia; and among Onagraceæ, it is peltate in Epilobium, &c., erect in Circæa, and pendulous in Haloragis.

We ought therefore, in sound philosophy, to disallow all the differences just enumerated, as available for the discrimination of natural orders, and yet they are of constant employment. If they were disallowed, the effect would be to reduce very considerably the number of natural orders, and to limit the remainder in a more positive manner; an advantage of no little moment in the existing state of systematical botany, in as much as it would tend to simplify the distinctions of the orders, and to remove the numerous inconsistencies whose existence it is at present impossible to deny. Many prejudices would be violently shocked, but an entirely new light would be thrown upon the real nature of vegetable affinities; Corylaceæ would be brought into the vicinity of Combretaceæ, and Tamaricaceæ of Sali

ceæ; Begoniaceæ would be associated with Melastomaceæ; Solanaceæ and Scrophulariaceæ, Geraniaceæ, Tropeoleæ, and Limnanthaceæ, would be respectively consolidated, and many more such changes might be expected.

For the natural orders now admitted in the writings of botanists the reader is referred to EXOGENS and ENDOGENS and to the numerous names of orders introduced in their places in the alphabetical arrangement of this work.

NATURAL PHILOSOPHY. [PHYSICS.]

NATURALIZATION. [ALIEN; DENIZEN.]

NATURE, LAW OF. [LAW, p. 361.]

NAUCLE'RUS. [FALCONIDÆ, vol. x., p. 186.]

NAUDE', GABRIEL, born at Paris in the year 1600, displayed at an early age a great aptitude for philological and critical studies. In 1622-3 he studied medicine, but it was not till several years later that he took his doctor's degree in that science at Padua. In 1624 he made his first journey into Italy, and on his return to Paris he published his work, 'Apologie pour les grandes Personnages faussement accusés de Magie,' 1625. In 1631 he accompanied the papal nuncio Cardinal de' Bagni on his return to Rome, and was appointed his librarian. While he was at Rome the controversy concerning the authorship of the book 'De Imitatione Christi' began. [KEMPIS, THOMAS A.] The Benedictines claimed the authorship for one of their order, John Gersen, abbot of Vercelli; whilst the regular canons of St. Généviève claimed it for Thomas à Kempis. Naudé, being in Italy, was requested to examine several MSS. of the work in question. His report was unfavourable to the claims of the Benedictines, who were much incensed against him, and accused him of bad faith. The affair then came before the courts in the shape of a charge of defamation; the suit lasted for years, and was at last compromised. In 1640 Cardinal de' Bagni died, and Naudé, after remaining some time with Cardinal Barberini, the nephew of the reigning pope Urban VIII., was recalled to Paris in 1642, and appointed librarian to Cardinal Mazarin. In this capacity he travelled through several parts of Europe to collect books and MSS. to enrich his patron's library, which was afterwards sold according to a sentence of the parliament of Paris, during the civil war of La Fronde, to the great sorrow of Naudé, who attempted to prevent what he considered an act of barbarism, 'Avis à Nosseigneurs du Parlement sur la Vente de la Bibliothèque du Cardinal Mazarin,' 1652. On receiving an invitation from queen Christina of Sweden, to be her librarian, Naudé went to Stockholm in 1652, where he was very well received. The climate of Sweden not agreeing with his health, he set out to return to Paris, but died on his way, at Abbeville, in July, 1653.

Naudé wrote numerous works in French and Latin, a catalogue of which is annexed to the 'Naudæana, ou Singularités remarquables prises des Conversations de M. Naudé,' 1701 and 1703; the latter edition is by Bayle. His principal works are—1, 'Instruction à la France sur la Verité de l'Histoire des Freres de la Rose Croix,' 1623, in which he shows the absurdity of the wonderful stories concerning the Rosicrucians, which had begun in Germany, and were then spreading into France. 2, 'Bibliographia Politica,' being a list of the principal writers upon politics, with his own remarks. 3, 'Avis pour dresser une Bibliothèque,' 1627. 4, 'Additions à l'Histoire de Louis XI.,' 1630. 5, 'De Studio Militari Syntagma,' 6, 'Jugement de tout ce qui a été imprimé contre le Cardinal Mazarin,' 4to., 1650. 7, 'La Marfore, ou discours contre les Libelles.' 8, 'Considérations politiques sur les Coups d'Etat,' Rome, 1639. Naudé says that he wrote this work at the request of and for the private perusal of his patron Cardinal de' Bagni, who however for his own convenience had twelve copies of it printed. The work was afterwards reprinted in Holland in 1667, and again in 1673, with comments by way of refutation, by L.D.M. (Louis Dumaz). The principles broached in this book are of a similar nature with those of the 'Principe' of Machiavelli. Among other things Naudé (in ch. iii.) approves of the massacre of St. Bartholomew, not on religious but on political grounds, considering the Huguenots as obstinate rebels, and says that the obloquy which has been thrown upon it is, 'because it was done only by half; for had all the heretics in France been cut off, the country would afterwards have enjoyed perfect tranquillity.'

Naudé was a man of irreproachable morals, of great learning, but self-opinionated and somewhat paradoxical. Father Jacob, in his 'Gabrielis Naudæi Tumulus,' 1659, has collected all the eulogies and epitaphs that have been written in his honour.

NAUMA'CHIA, the representation of a sea-fight among the Romans, which was sometimes performed in the Circus Maximus or amphitheatre, water being introduced sufficient to float ships, but more frequently in places made especially for the purpose, which were called Naumachiæ. Julius Cæsar appears to have been the first who gave a representation of a sea-fight on an extensive scale. He dug a lake in the Campus Martius for the purpose, which however was filled up in his life-time (Dion Cass., xl. 23; Suet., *Jul.*, c. 39, with Casaubon's note, and c. 43). Augustus also dug a lake near the Tiber for the same purpose, which was afterwards turned into a park or plantation ('*nemus*;' Suet., *Oct.*, 43; Tac., *Ann.*, xii. 56). Another lake was dug in the Campus Martius by Caligula (Dion Cass., lix. 10); but Claudius exhibited a naumachia on the lake Fucinus, now Celano. (Suet., *Claud.*, 21; Dion, lx. 33; Tac., *Ann.*, xii. 56.) The old naumachia (*vetus naumachia*), in which Titus is said by Suetonius (*Tit.*, 7) to have exhibited a sea-fight, has occasioned some dispute among the learned; some understanding it to be the Circus Maximus, and others the lake dug by order of Augustus (Ernesti on Suet., *Tib.*, 72). Domitian appears to have been the first who erected a building of stone around these artificial lakes (Suet., *Dom.*, 4, 5). Previous to his time the spectators appear to have sat upon wooden benches, which might be easily made to rise gradually above one another with the earth which had been dug out of the artificial lake. In later times the naumachiæ were usually surrounded with buildings like the amphitheatre or circus.

The ships which were engaged in these sea-fights were divided into two parties, which were called respectively by the names of different maritime nations, as the Tyrian and Egyptian fleets (Suet., *Jul.*, 39), the Sicilian and Rhodian (Suet., *Claud.*, 21), &c. The combatants, who were called Naumachiarii (Suet., *Claud.*, 21), were usually composed of captives or criminals, who fought to death, unless saved by the clemency of the emperor. These sea fights were said to have been exhibited on such a scale of magnificence and splendour as almost to surpass our belief. In the naumachia exhibited by Nero there were sea-monsters swimming about in the artificial lake (Suet., *Nero*, 12), and Claudius caused a Triton, made of silver, to be placed in the middle of the lake Fucinus, who was made, by machinery, to give the signal for attack with a trumpet. (Suet., *Claud.*, 21.) In Domitian's naumachia the number of ships engaged was almost equal to two real fleets (*pæne justæ classes*, Suet., *Dom.*, 4); and in the sea-fight on the lake Fucinus, there are said to have been no fewer than 19,000 combatants. (Tac. *Ann.*, xii. 56.)

NAUMBURG, on the Saale, a very considerable town of Prussian Saxony, in the government of Merseburg, is situated in 51° 9′ N. lat. and 11° 40′ E long., at a short distance from the junction of the Unstrutt with the Saale. It consists of the town itself, the liberties, and three suburbs. There are several remarkable buildings in this city, especially the churches. The cathedral (in the liberties), founded in 1028, is an interesting specimen of old German architecture; its antient monuments, altars, statues, carved work, paintings, are well worthy of observation. Connected with the cathedral are residences of the canons. The church of St. Wendel (which has a celebrated organ, and many fine paintings, one of which is by L. Cranach, 'Christ blessing the little Children') and the church of St. Maurice, with the monument of bishop Richwins, are likewise interesting. Among the other public buildings, the principal are the court of justice, the town hall, the gymnasium (or cathedral school), and the city school. Besides the above, there are two churches, two orphan houses, six hospitals, and several schools.

Naumburg is the seat of the chapter, of the supreme tribunal for the governments of Merseburg and Erfurt, of several supreme courts of justice, a tribunal of commerce, &c. Naumburg is a very thriving town; the inhabitants, now above 12,000, carry on manufactures of woollens, linen, stockings, gloves, and leather; starch, white-lead, soap, vitriol, aquafortis, vinegar, beer, and brandy are made both for the consumption of the surrounding country and for exportation to foreign parts. Wine produced in the vicinity is a considerable article of trade; the red is better than the white, and is often sold as French. There are a few houses that carry on very extensive dealings

'n wool. There are two annual fairs, one in June, instituted in 1514, by the emperor Maximilian I.; the other, in December, instituted in 1818, by the king of Prussia. These, and three other annual cattle and horse fairs, contribute greatly to the prosperity of the town. An interesting ceremony, called the Kinderfest (*i.e.* the children's fête), is annually celebrated in commemoration of an attack made on the town on the 28th of July, 1482, by the Hussites under Procopius. On that day, by the advice of a citizen named Wolf, all the children, dressed in shrouds, each carrying a lemon and a green bough, went out of the city to beg mercy for their parents and for the city. Procopius, who had threatened utterly to destroy the town and the inhabitants, because the late bishop had voted at the synod of Köstnitz for the death of John Huss, was so affected that he raised the siege. Though the memory of this event has been handed down for above 300 years, some modern historians have doubted the fact. On the 5th of November, 1632, the great Gustavus Adolphus here took his final leave of his queen before the battle of Lützen.

(Müller, *Handbuch;* also local descriptions by Lepsius, 1822; and Kratsch, 1827.)

NAUPACTUS. [LOCRIS.]

NAU'PLIA. [NAPOLI DI ROMANIA.]

NAU'PLIUS. [BRANCHIOPODA, vol. v., p. 340.]

NAU'TILIDÆ, or NAUTILA'CEA, according to Lamarck, the sixth family of his *Polythalamous Cephalopoda*, consisting of the genera *Discorbites, Siderolites, Polystomella, Vorticialis, Nummulites*, and *Nautilus*. To these Mr. G. B. Sowerby, jun. adds *Simplegas* and *Endosiphonites*. In the system of M. de Blainville it is the fifth family of his *Polythalamacea*, and comprises the genera *Orbulites, Nautilus, Polystomella*, and *Lenticulina*.

NAU'TILUS, a genus of cephalopods with polythalamous or chambered shells, established by Linnæus, who gave the following as the generic character: '*Animal* (' Rumph. Mus.,' t. 17, f. D) *Testa* univalvis, isthmis perforatis concamerata, polythalamia.' And he divided the genus into

*

Spiral *rounded.*

In which section he placed the species *N. Pompilius, Calcar, Crispus, Beccarii, rugosus, umbilicatus, Spirula*, and *semilituus*. Of these, all, except *Nautilus Pompilius*, and *N. Spirula*, the latter of which is separated as a cephalopodous genus under the name of *Spirula*, are minute chambered shells, for the most part from the Adriatic Sea.

* *

Elongated, suberect (erectiusculi).

In this section the species are *obliquus, Raphanistrum, Raphanus, Granum, Radicula, Fascia, Sipunculus, Legumen, Orthocera*. Of these, all but *Orthocera* are minute, and from the Adriatic and Mediterranean. *Orthocera*, now established as a fossil genus of cephalopods under the name of *Orthoceras*, though described by Linnæus as fossil, seems to have been considered by him as not without a living analogue; for he writes,—'Habitat in alto Pelago; Fossilis:' and he has the following observation:—'Testa frequentissima petrificata in montibus nostris calcareis, inter omnia fossilia nobis nota sæpe longissima, *non dum visa immutata*.'

Lamarck thus characterises the genus *Nautilus* :—

Shell discoid, spiral, multilocular; with simple walls (à parois simples). Whorls contiguous; the last enveloping the others. Chambers numerous, formed by transverse partitions (cloisons), which are concave towards the side next to the aperture; their disk perforated by a tube, and their edges very simple.

Lamarck records only two species, *Nautilus Pompilius* and *N. umbilicatus*. For the animal he refers to Rumphius and Denys de Montfort.

Cuvier observes, in his last edition of the 'Règne Animal,' that Linnæus united in his genus *Nautilus* the genera *Spirula* of Lamarck, and the *Nautili, properly so called*. Of the latter he remarks that they have a shell differing from that of the *Spirulæ*, inasmuch as the laminæ increase very rapidly, and the last whorls touch, but envelop the preceding whorls. The siphon, he adds, is in the middle of each septum. He refers to the *Nautilus Pompilius* of Linnæus as the species most known, and he refers to Rumphius for the animal, observing however, in a note, that the figure of Rumphius is not to be deciphered (indéchiffrable), and that it is matter of wonder that the numerous naturalists who have visited the Indian Seas have not examined or captured so curious an animal, and one which belongs to so common a shell.

M. de Blainville thus describes the genus:—

Animal having the body rounded, and terminated behind by a tendinous or muscular filament, which attaches itself in the siphon with which the chambers of the shell are pierced; mantle open obliquely, and prolonging itself into a sort of hood above, the head provided with tentacular appendages, which are, as it were, digitated, and surrounding the aperture of the mouth.

Shell discoid, but little compressed, with the back rounded or subcarinated, umbilicated or not, but never mammellated (mamelonée); the chambers simple, invisible externally; the last deeply hollowed and pierced by one or two siphons.

The same zoologist thus divides the genus.

A.

Species not umbilicated; back rounded; aperture round a single, subcentral siphon.

Example, *Nautilus Pompilius*, Linn.

B.

Species not umbilicated, with a carinated back and angular opening. (*Angulithes*, De Montf.)

Example, *Nautilus triangularis*.

C.

Umbilicated species, with the back rounded and a single siphon. (*Oceanus*, De Montf.).

Example, *Nautilus umbilicatus*.

D.

Umbilicated species, with the back rounded and two siphons. (*Bisiphites*, De Montf.)

Example, *Nautilus Bisiphites*.

M. Rang, under the genus *Nautilus* of Linnæus, places also *Aganides, Angulithes, Canthropes, Oceanus, Bisiphites*, and *Ammonites* of De Montfort. All De Montfort's genera, except Oceanus and Ammonites, are fossil only: the former he describes as coming from the Moluccas. It is, as far as one can judge from the figure, a very young shell, possibly the young of *Nautilus Pompilius*. *Ammonites* is described as coming from the China Seas, and is, apparently, a specimen of *Nautilus umbilicatus*. De Montfort considers it as the type of a species of *Ammonites* analogous to the Ammonites, or *Cornua Ammonis* 'à cloisons unies.' He further says that he possessed a superb petrification of this Ammonite a foot in diameter.

M. Rang gives the following generic character of Nautilus:—

Animal bursiform, lodged partially in the last chamber of the shell, furnished posteriorly with an appendage or particular organ, destined to traverse all the chambers, and placed in a siphon, which serves it as a sheath; mantle prolonged above the head, which is furnished with a great number of sessile arms surrounding the mouth.

Shell discoid, regularly spiral, rolled on the same plane, embracing or not, with contiguous whorls; siphon central, or placed 'contre le retour de la spire.'

The animal, he says, is only known from the figure of Rumphius, which leaves so much to be desired. He divides the genus into two subgenera.

I. Subgenus. Nautili, properly so called.

Animal, as described in the generic character.

Shell with a spire either embracing or not; chambers united (unies); siphon central, or approximated to the penultimate whorl of the spire, without being contiguous to it.

1st group.

Spire embracing (Genera—*Nautilus, Angulithes, Oceanus*, De Montf.).

Nautilus Pompilius, &c.

2nd group.

Spire exposed (à découvert)—(*Ammonites*, De Montf.).

Nautilus umbilicatus, &c.

II. Subgenus (*Aganides*, De Montf.).

Animal unknown.

Shell with an embracing spire; partition disunited by two interior prolongations of its borders; siphon touching the penultimate whorl of the spire.

All the descriptions of the animal above given seem to have been taken from the figure of Rumphius. We therefore give a copy of this figure, which represents the animal in a supine position. The general form is not inaccurate, but th. details are confused; and many of them incorrect, the funnel

for instance, which is erroneously represented as round. That which an ordinary spectator would take for the eye, is merely an opening between the digitations: the mantle is torn, and so represented as to mislead the spectator.



Animal of Nautilus Pompilius, from Rumphius.

The following is the description of Rumphius, and it has much more merit than his figure:—

'The fish that inhabits this shell (the Nautilus) is a species of Polypus (*i.e.* Cephalopod; πολύπους, Aristotle; *Poulpe*, French), but of a particular aspect, moulded according to the concavity of the shell, which it does not quite fill when it holds itself retracted therein.

'The posterior part of the body fits into the bottom of the cavity, while the superior parts (which are inferior when the animal drags itself along the bottom) are flattened, but also rounded off, plaited, and of cartilaginous texture; coloured with brown or washed with red; spotted with blackish marks, which run one into another, as in the Cuttle-fish (*Veelvoet*). The posterior part of the body, which presses against the shell below the convexity (kiel), and which, in its progression, becomes the superior part, is also a little cartilaginous, but not so much so as the anterior parts, which are covered with a number of cavities (wratten).

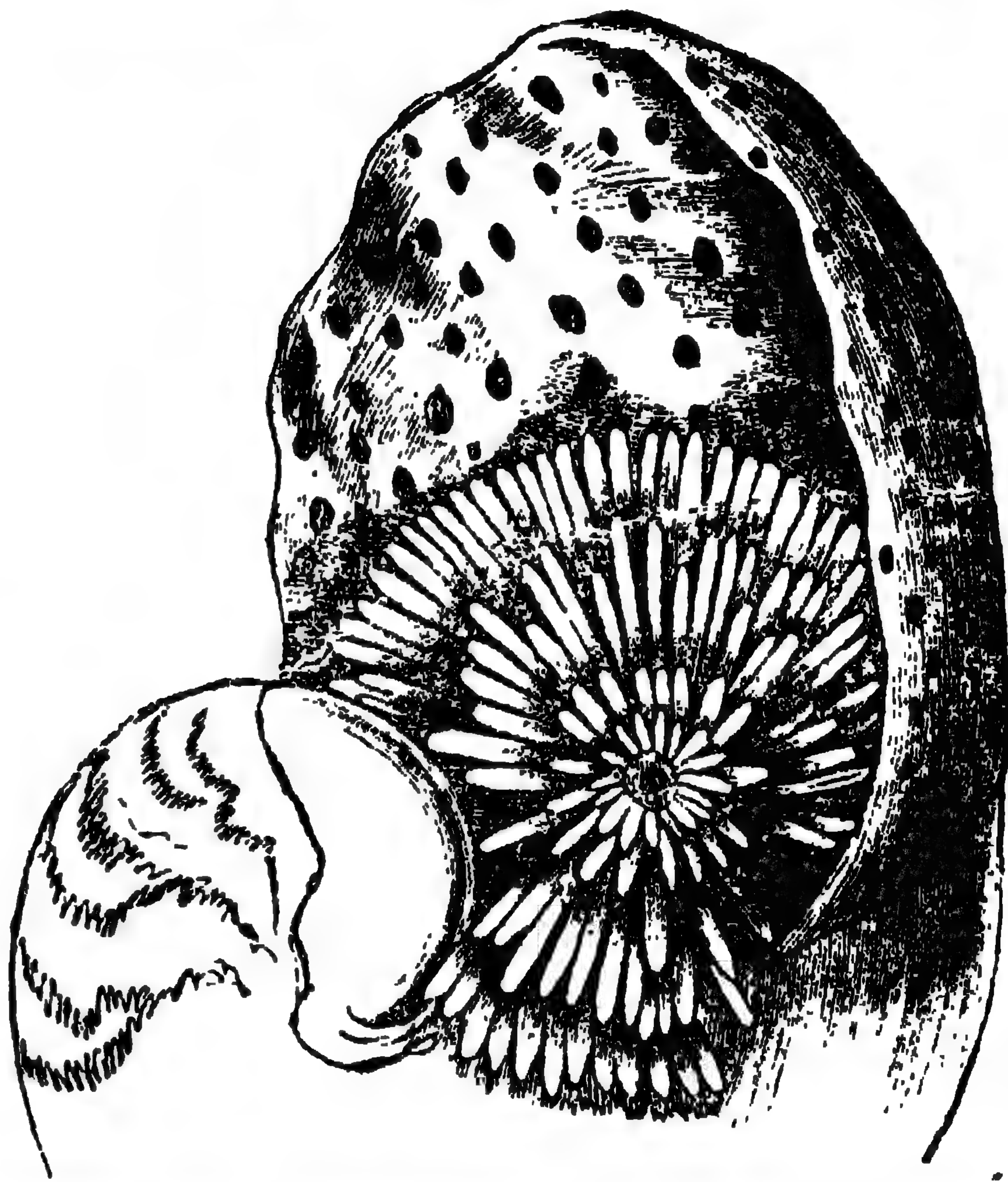
In the middle of these parts, in front of the head, there is a considerable lump of little feet, which terminate in fleshy processes laying one over another, and which cover the mouth on each side: these processes are formed like the hand of a child. The largest, or those which are exterior, are terminated by twenty of these fingers or little feet, each as long as half a finger, as thick as a straw, round, smooth, having none of those suckers we see on the feet of the Cuttles, but a little flattened or divided at the end. The great fleshy processes are succeeded by others, which are shorter, and have only sixteen fingers, and these are followed successively by others still shorter, which go on covering even to the mouth.

'The animal can retract or elongate these fingers at will, for they not only serve as feet to creep withal, but also as hands to seize his prey and carry it to the mouth. This mouth is armed by a very hooked beak, formed like that of a Coccatoo or a Seacat (Sepia?). The upper beak is large, hooked, dentated on the edge; the lower beak is small, concealed, or, as it were, shut up in the upper. Both sharp, and calculated to pierce flesh (*vleesch*). This beak is hard as bone, and its colour of a blackish-blue, surrounded by circular lips of a white colour, fleshy or parchment-like. These are produced sometimes so as to cover entirely the beak, which at other times is almost entirely concealed by a gelatinous deposition, and by the multitude of feet which surround it, so that it cannot be seen without violent means being used.

'The eyes are placed a little low down, laterally disposed, very large, large as beans, without an inferior eyelid, pierced in the middle; but we cannot find the lens (oogappel), they are filled with dark-brown blood.

'From the hinder part of the body, to wit, that which rests upon the last partition, goes a long artery (ader) through all the partitions and through all the chambers, even unto the extremity of the spire, the middle hole to which the fish hangs fast to the shell: excepting this part, the chambers are entirely empty, and it breaks readily when the fish is drawn out. Under the beak (snuit) is a half pipe (canal) of a rounded form, one side rolled over the other, of a whitish flesh, like as in the Sea-cat (Sepia), and in this is concealed a sort of tongue. It is most likely the same canal as that by which the Zeekat ejects its black blood.' (*Rariteit-Kamer*, book ii.)

This figure and description warmed the imagination of Denys de Montfort, who published a ludicrous representation of the supposed animal seated in its shell, and expanding its hand or sail. This has been copied by Shaw; and as it has been published by that zoologist in his Lectures, we give a copy of the monster, which was meant to pass current for the inhabitant of the shell.



Supposed animal of Nautilus Pompilius. (Denys de Montfort and Shaw.)

It will be now necessary to go back to the earlier authors, and to inquire whether this animal was known to them. After reading the following passages, few will hesitate to concede that it was known to the father of natural history.

Aristotle (*Hist. Nat.*, iv. 1), after well describing the different μαλάκια (naked cephalopods), says, 'There are also two Polypi in shells; one is called by some *Nautilus*, and by others *Nauticus*. It is like the *Polypus;* but its shell resembles a hollow comb or pecten, and is not attached. This Polypus ordinarily feeds near the shore; sometimes it is thrown by the waves on the dry land, and the shell falling from it, it is caught, and there dies. These are small, and in form like the *Bolitænæ*' (cephalopods probably, of the form of which *Eledone moschata* is the type). 'And the other,' continues Aristotle, 'is in a shell, like a snail; and this does not go out of its shell, but remains in it like a snail, and sometimes stretches forth its arms (or cirri, πλεκτάνας) externally.'

The first of these Polypi is evidently the *Nautilus* or *Pompilus* of Pliny and other antient writers, the *Argonauta* of Linnæus and the moderns, which is treated of in this work under the title PAPER NAUTILUS.

The second, to which the term *Pompilius* is now exclusively applied, is, as evidently, the *Nautilus* of Lamarck, to which genus alone this article will be confined.

Belon figured the shell of the animal, now termed *Nautilus Pompilius* (and we believe that his figure is the first that appeared) under the name of *Nautilus alter seu secundus;* but it seems clear that he was unacquainted with

the soft parts. *Rondeletius*, apparently confounding Aristotle's two genera of Polypi, seems to refer the animal of the first to the shell of the second; and dwells on the impossibility of so delicate and feeble an animal dragging about so heavy a shell.

Gesner relates that 'Jo. Fauconerus,' a celebrated physician of England, formerly gave him the picture of a *Nautilus*, with a written description (by letter). This description Gesner gives; and it is not improbable that the soft parts there described may have been those of *Nautilus Pompilius* (it is clear that the shell was); but the account is so obscure and brief that there is room for doubt, though the term *velum* is used, which would hardly be applicable to the palmated arms or *vela* of the other kind.

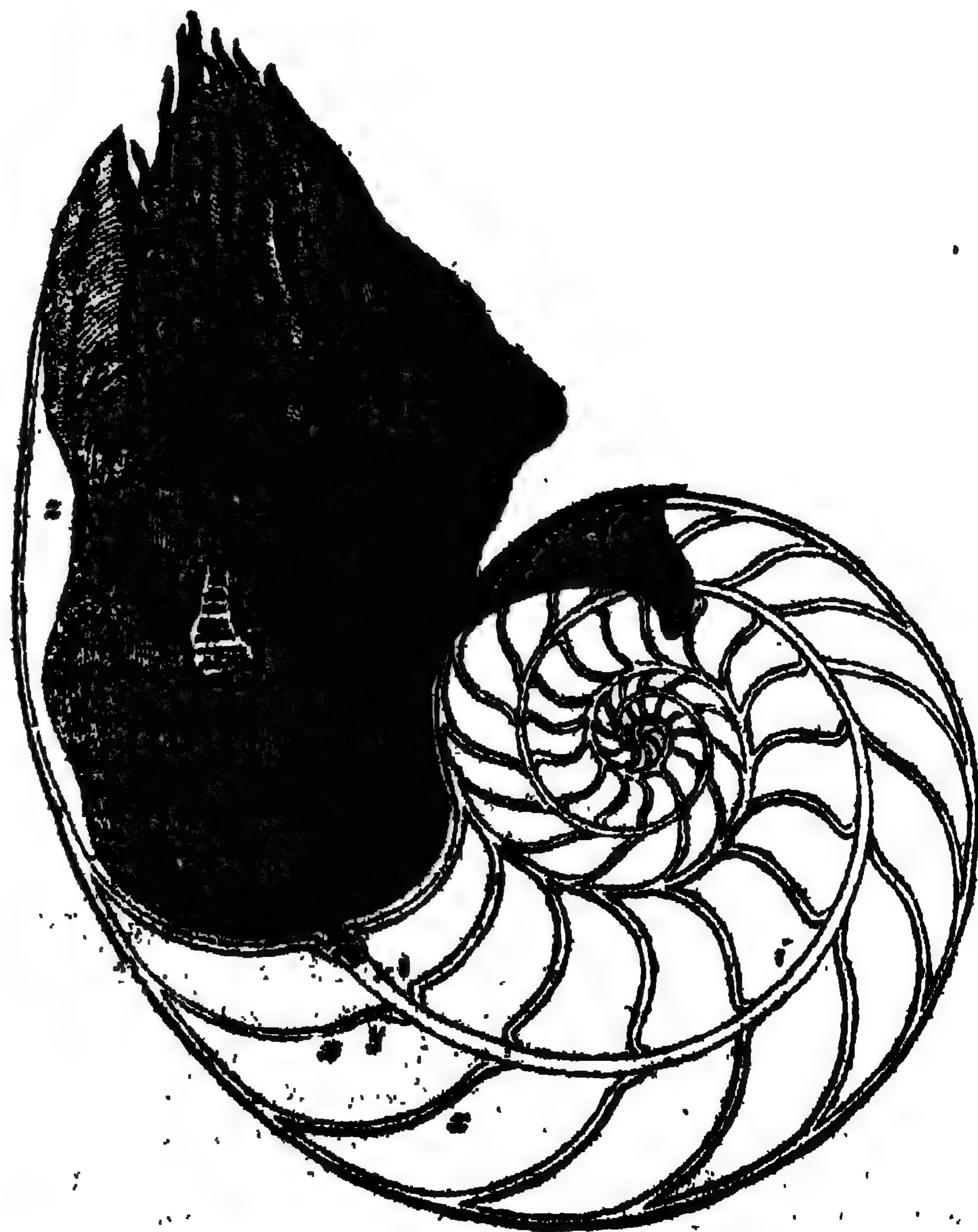
We now return to the period which followed the publication of Rumphius's figure; and for many years no further information was obtained, though special directions were given by the French and other nations to collectors to be assiduous in procuring the soft parts. These directions were given in vain, and all was conjecture. Fragments even of molluscous animals were caught at and published as probable parts of this much desired animal; and MM. Quoy and Gaimard published their 'Description d'un Fragment de Mollusque inconnu, presumé être celui du Nautile flambé' (Nautilus Pompilius, Linn.), with figures, in the 'Annales des Sciences Naturelles' (vol. 20). The materials are not sufficient to come to any safe conclusion as to the animal, of which the fragment was a part; but it may *now* be confidently denied that it is any portion of the soft parts of *Nautilus Pompilius*. The parenchyma of the fragment indeed is said to have been identical with that of *Firola* and *Carinaria*. This fragment is preserved at Paris in the Jardin du Roi.

The recovery of this interesting animal was reserved for a British voyager; and its structure has been demonstrated and illustrated by Professor Owen in a most masterly manner, leaving nothing to be wished, excepting that some fortunate collector may speedily capture a male specimen, and put it into his skilful hands.

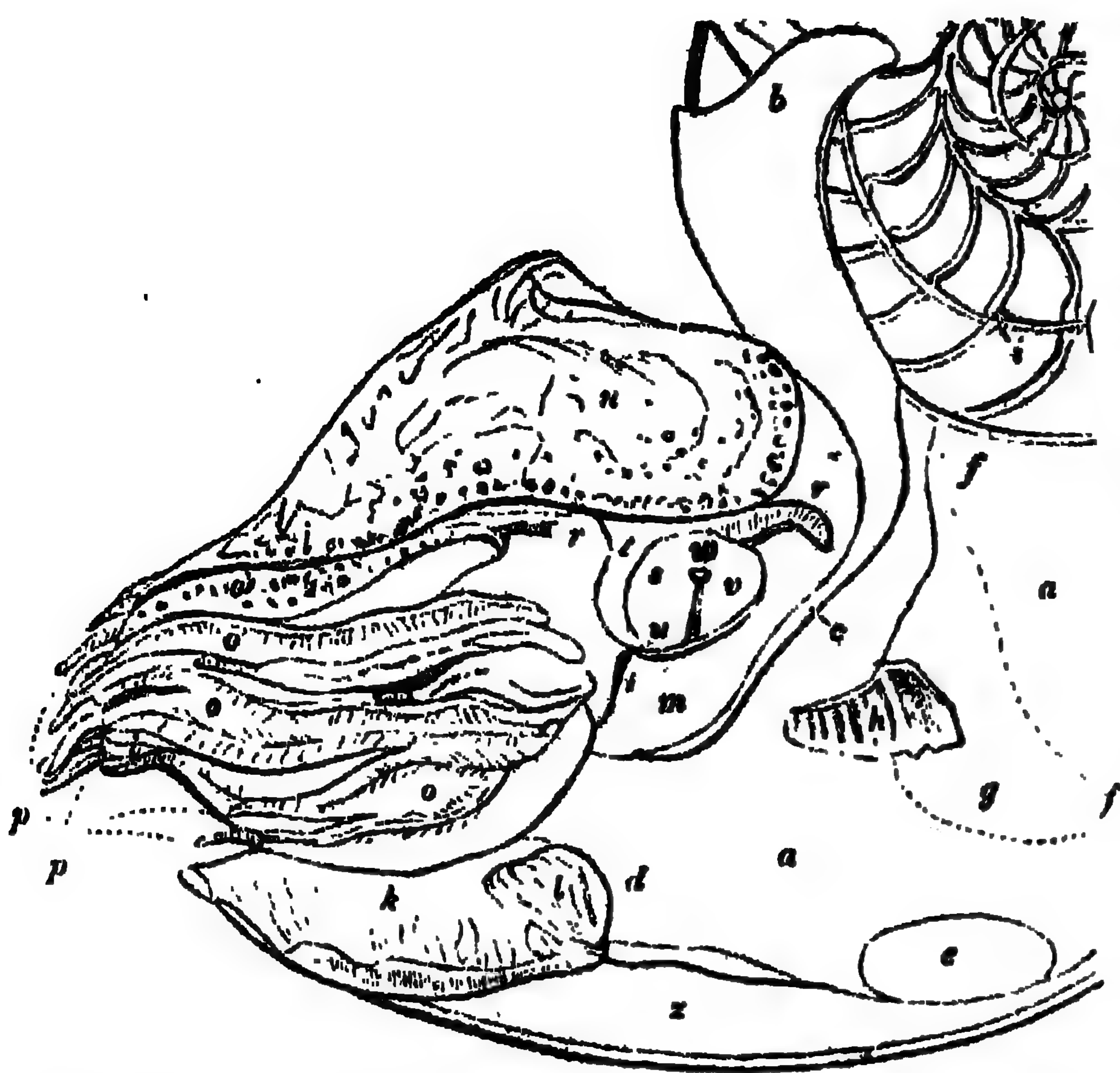
Mr. George Bennett, F.L.S., a member of the Royal College of Surgeons, thus describes the capture of this interesting animal in his 'Wanderings in New South Wales,' &c.:—'It was on the 24th of August, 1829 (calm and fine weather, thermometer at noon 79°), in the evening, when the ship Sophia was lying at anchor in Marakini Bay, on the south-west side of the island of Erromanga, one of the New Hebrides group, Southern Pacific Ocean, that something was seen floating on the surface of the water at some distance from the ship; to many it appeared like a small dead tortoise-shell cat, which would have been such an unusual object to be seen in this part of the world, that the boat which was alongside the ship at the time was sent for the purpose of ascertaining the nature of the floating object. On approaching near it was observed to be the shell-fish commonly known by the name of the Pearly Nautilus (*Nautilus Pompilius*); it was captured and brought on board, but the shell was shattered, from having been struck with the boat-hook in capturing it, as the animal was sinking when the boat approached, and had it not been so damaged it would have escaped. I extracted the fish in a perfect state, which was firmly attached to each side of the upper cavity of the shell. On being brought on board, I observed it retract the tentacula still closer than before, and this was the only sensation of vitality it gave after being caught; I preserved the soft parts immediately in spirits, after making a rude pen-and-ink sketch of its form. On breaking the lower part of the shell, the chambers or cavities were found filled with water. The *hood* has been stated by Dr. Shaw (*Lectures*, vol. ii., p. 165) as being of a pale reddish purple colour, with deeper spots and variegations; the colour however, as it appeared in this recent specimen, was of a dark reddish-brown, in fact, resembling the colour produced by the *Koka* on the stained cloth of the Tongatabu natives, intermingled with white. We had fine weather; light winds and calms a day or two previous to this animal being caught.' After noticing the incorrectness of Shaw's figure (which, as we have above noticed, was copied from those given by Denys de Montfort), and the greater general accuracy of that of Rumphius, Mr. White informs us that this species is called *Kika*, *Lapia*, and *Krang Modang* by the natives of Amboyna; and *Bia papeda*, *Bia cojin*, by the Malays. He then adverts to another instance of the capture of this animal, by an officer of H.M.S. Ariadne, on a reef at the island of Pemba near Zanzibar, on the east coast of Africa, in 1824. The animal was not floating upon the water, but was in a hole on the reef, and the officer did not recollect which part of the shell was uppermost. The mantle, like a thin membrane, covered the shell, and was drawn in as soon as it was touched, when the shell was displayed. 'I and others,' said this officer to Mr. Bennett, 'when it was first seen, did not notice it, regarding the animal, as the membrane enveloped the shell, merely as a piece of blubber; but having touched it by accident, the membranous covering was withdrawn, and we soon secured our beautiful prize. The fish was a large mass attached to the shell, which we soon extracted and threw away, *as we only wanted to collect shells*.' The same officer compared the mantle to what he had subsequently seen covering the shells of the *Harps* [ENTOMOSTOMATA, vol. ix., p. 455] and *Cowries*. [CYPRÆIDÆ.] Mr. Bennett states that a section of the shell captured by him was afterwards made on board, but none of the appearances, nor whether air or water was contained within, could be recollected. A mate of a whaler, who had been shipwrecked upon the Feejee Islands in the South Pacific, and had resided among that group for nearly three years, told Mr. Bennett that he had seen the shell of the *Pearly Nautilus*, containing the living animal, floating on the water near one of the islands. He had only seen two living, although the empty shells were very numerous among the islands. The first he saw when in a canoe with some other shipwrecked Europeans; it was then floating on the surface of the water with the mouth of the shell uppermost. It was enveloped in the mantle, which extended some distance upwards, and over the whole of the shell; and it had such an appearance as caused one of the men to say, 'There is a large piece of blubber upon the water.' On approaching it the animal, retracting the mantle, displayed the beautiful striped shell, and sank before they could capture it. (G. Bennett, *Wanderings*, vol. ii.)

The specimen captured by Mr. Bennett is preserved in the museum of the Royal College of Surgeons in London, and has produced the admirable 'Memoir on the Pearly Nautilus (*Nautilus Pompilius*, Linn.), with illustrations of its external form and internal structure,' published by direction of the council of the college, a summary of which we shall endeavour to lay before our readers.

The external form, of which an elaborate description is given, for which we must refer our readers to the 'Memoir' itself, will be collected from the following cuts, which are reduced from Professor Owen's figures.



Nautilus Pompilius (female) in the prone position, with its natural relation to the shell shown by a section of that part in outline. (Reduced from Owen.)



The same, with the animal as well as a part of the shell in outline, explanatory of the parts, on a larger scale. (Reduced from Owen.)

a a, the mantle; *b*, its dorsal fold, applied to the involute convexity of the shell; *c*, its free anterior margin; *d*, the orifice for the passage of the funnel; *e*, the convexity produced by the ovarian gland; *f f*, the horny girdle for the adhesion of the mantle to the shell; *g*, the horny laminæ covering the extremity of the left shell muscle; *h*, a portion of the shell, which was left adhering to this muscle; *i*, the membranous tube or siphon, which traverses the testaceous tubes in the camerated portion of the shell; *k*, the funnel; *l*, the left lateral process of the funnel; *m*, the left crus or pillar of the funnel; *n*, the hood, or ligamento muscular disk that surmounts the head; *o o*, the exterior digitations on the left side; *o'*, the larger one, with a papillose surface like that of the hood; *p p*, the digited tentacles, protruded from their sheaths; *q*, the groove which separates the hood from the papillose digitation; *r r*, the ophthalmic receptacles; *s*, the eye; *t*, its peduncle; *u*, the inferior ridge or rudimentary eyelid; *v*, the ridge running from this to *w*, the pupil; *x x x*, the partitions of the chambers; *y y y*, the septal tubes, which give passage to the membranous siphon; *z*, the chamber of occupation. (Owen.)

Professor Owen thus concludes the elaborate description to which our limits have compelled us to refer our readers:—'From what has been already said, it will be seen how considerable are the external differences between the *Pearly Nautilus* and the higher *Cephalopods;* nevertheless its general plan of organization renders its claim to rank with them indisputable; and as its locomotive apparatus is confined to the head, the received denomination of the class remains undisturbed by its admission. The inferior or ventral pair of labial processes I consider as analogous to the superadded pedunculated arms of the Cuttle-fish and Calamary, which also come off more internally than the shorter arms, and are approximated or united at their bases on the ventral aspect of the mouth. The other pair in *Nautilus* appear to result from a higher degree of organization of the part analogous to the external lip in the preceding genera. The curtailed digitations are however but feeble representatives of the elongated and cotyligerous arms of the Poulp or Cuttle-fish; and the retractile tentacles, pedicellate eyes, and flattened disk, which, according to the testimony of Rumphius, is applied to the ground in the progressive motions of the animal, attest an obvious tendency towards the *Gasteropoda*. And while tracing these examples of affinity with the different and heretofore widely spread groups of *Mollusca*, between which this remarkable form, I apprehend, is osculant, there may also be perceived in the whole of this singular but at the same time regular and symmetrical arrangement of the palpigerous organs about the mouth, an analogical relation to the higher *Annulosa*.'

Before Mr. Owen enters upon *the Muscular System*, which is described carefully and in detail, he notices what he aptly terms the internal skeleton or frame-work from which its principal masses take their origin. Like that of the *Dibranchiate Cephalopods*, this skeleton, according to Mr. Owen, is cartilaginous, yields readily to the knife, and in texture and semitransparency closely resembles the cartilage which constitutes the skeleton of the Skate. In *Sepia*, he observes, this cartilaginous part completely encircles the œsophagus, and on the dorsal aspect of that tube is dilated into a large cavity, which contains the brain; but in *Nautilus* the circle is incomplete behind, and the brain is protected only by its membranous sheath.

Digestive System.—The jaws are two, endowed with a vertical motion, and in form resembling a parrot's bill reversed, the upper mandible being encased in the lower when they are closed. Posteriorly they are adapted to a muscular basis, to which they owe their motions. 'Thus far,' continues Mr. Owen, 'they resemble the mandibles of the *Dibranchiate Cephalopods;* but they are not composed entirely of horny matter, nor are they uniformly of a brown or black colour, their extremities being of a dense calcareous nature, and of a bluish-white colour; they are also less pointed at the end, and the oval margins of the lower mandible are notched and dentated.' They are larger in proportion than in the Cuttle-fish. Mr. Owen proceeds to state that the calcareous extremities of both mandibles are of a hardness apparently adequate to break through the most dense crustaceous coverings, or even shells of a moderate thickness. The extremity of the upper mandible is sharp-pointed, and solid to the extent of five lines from the extremity; but in the lower one the calcareous matter is deposited on both sides of a thin layer of the black horny substance, and thus a combination of tough with dense matter is obtained, which much diminishes the liability to fracture. This mandible is also more hooked than the upper one, but is more obtuse at the end. 'It seems,' observes Mr. Owen, 'from its dentated margin, evidently intended to break through hard substances, whilst the sharp edges of the beak of the Cuttle-fish better adapt it for cutting and lacerating the soft bodies of fish.' In the particulars here stated the mandibles of *Nautilus* differ, as Mr. Owen remarks, from those of every other known species of recent *Cephalopods.* The circular lip which surrounds the jaws is much deeper than in the Cuttle-fish, and the jaws are provided with four retractor muscles, and one for protrusion. The tongue is large, and supported by an oblong horny substance. The fleshy substance is produced anteriorly, and forms three caruncles, which are very soft in texture, and beset by numerous papillæ, having all the characters of a perfect organ of taste. The anterior extremity of the horny substance is embraced by a pair of retractor muscles, which arise from the posterior margin of the lower mandible, and four delicate retractor or depressor muscles are inserted into the anterior or terminal caruncle. Behind the caruncles the dorsum of the tongue is encased with a thin layer of horny matter, from which arise four longitudinal rows of slender recurved prickles between one and two lines in length, the same in number as the labial tentacles, viz. 12. There is an analogous structure in the *Cephalopoda* and in many of the *Gasteropoda.* 'The necessity of such a structure,' says Mr. Owen, 'becomes very apparent in the *Pearly Nautilus*, if, as Rumphius has asserted, it creeps with the shell uppermost; since in that case the tongue, having its position reversed, would be opposed instead of being assisted by gravitation while regulating the movements of the food in the mouth. And it is worthy of remark that in the Flamingo, which turns the upper mandible to the ground while taking its food, the tongue is similarly armed with regularly developed recurved spines, calculated, as in the *Pearly Nautilus*, to rake the alimentary morsels towards the fauces.' [FLAMINGO, vol. x., p. 293.] Behind the horny parts the tongue again becomes soft and papillose, but the papillæ are larger and coarser. The only traces of a salivary system detected were in two broad fleshy processes projecting forwards from the sides of the fauces: they were papillose, and perforated in the middle of their inner surfaces by a small aperture which led into a glandular cavity between the folds of the membrane, and from these cavities an opaque whitish substance could be expressed. In the *Dibranchiate Cephalopods* these glands are remarkably developed. The alimentary canal, which was filled with the fragments of crustaceans, was everywhere connected to the parietes of the abdomen by numerous filaments; the only trace of a mesentary existed between the last two portions of the intestine, which were connected together by the ramifications of an artery and vein. Among the crustaceous fragments, portions of branchiæ, claws, and palpi were distinctly recognised, so as to leave no doubt that the greater part of them had belonged to a *Brachyurous Decapod* of a hirsute character, and not a swimmer. The crop, which was capacious and pyriform, was tensely filled with these fragments, and Mr. Owen remarks that the capability of propelling such rude and angular particles through a narrow canal into the gizzard without rupturing the tunics of the preparatory cavity is not one of the least extraordinary examples of the powers of living matter. The gizzard very much resembles

that of a fowl, as it does in *Octopus*. A globular cavity communicates with the intestine at a little distance from the pylorus, and its reception of the biliary secretion renders it in some measure analogous to a gall-bladder; but Mr. Owen thinks that its chief use is probably to pour into the commencement of the intestinal canal a fluid necessary for digestion; so that, like the laminated and spiral cœcum of the higher *Cephalopods*, and the pyloric appendages of fish, it is essentially a simple form of pancreas. The interior of the alimentary canal, which was filled with smaller fragments of crustaceous shell, presented a few longitudinal rugæ and slight transverse puckerings. The liver is bulky, and extends on each side of the crop from the œsophagus to the gizzard. There was no trace of structure analogous to the ink-bag of the *Dibranchiate Cephalopods*.



Nautilus Pompilius, in the prone position, with the labial processes and tentacles, the mandibles, and the digestive organs displayed. (Reduced from Professor Owen's figure.)

a a, the hood, or upper part of the oval sheath, longitudinally divided; *b b*, the posterior lobes or angles of the hood; *c c*, the posterior concavity of the hood; *d d*, the ridge in the same; *e e*, the cut surfaces of the above parts; *f f*, the internal surface of the oval sheath; *g g*, the external labial processes; *h h*, the external labial tentacles; *i i*, the internal labial processes; *k k*, the internal labial tentacles; *l*, the olfactory laminæ; *m m*, the circular fringed lip, longitudinally divided; *n*, the superior mandible; *o*, the inferior mandible; *p*, the muscular basis on which the mandibles are fixed; *q q*, the superior pair of muscles which retract the jaws; *r r*, the semicircular muscle which protrudes the jaws, divided longitudinally; *s*, the œsophagus; *t*, the crop; *u*, the narrow canal leading to *v*, the gizzard; *w*, the intestine; *w'*, the terminal fold of intestine drawn out of its situation; *x*, the anus; *y*, the laminated pancreatic bag; *z*, the liver; 15, a branch of the anterior aorta, which ramifies in the membrane connecting the two portions of the terminal fold of the intestine; 19, the continuation of the posterior aorta along the dorsal aspect of the crop; 20, its bifurcation at the œsophagus, to form a vascular circle corresponding to the nervous circle round that tube; 21 and 22, arteries of the crop, gizzard, &c. (Owen.)

In the museum of the Royal College of Surgeons (*Physiological Series*, No. 499, A.) is a preparation exhibiting the crop, gizzard, and laminated pancreatic pouch. (See the *Catalogue*, vol. i.)

Circulating and Respiratory System.—Our limits will not permit us to go into the details of this system in the Pearly Nautilus, interesting as it is. The respiratory organs are elongated and pyramidal, and have the same laminated structure and symmetrical disposition as in the cuttle-fish; but *they are four in number*, being disposed two on either side, and each pair arising by a common peduncle from the inner surface of the mantle. 'From this difference in the number of branchiæ, in addition to the other peculiarities in the structure of *Nautilus*,' says Mr. Owen, 'the existence of at least two orders of the class *Cephalopoda* is, I imagine, demonstrated; and the denominations of these orders might conveniently be taken from the modifications of the respiratory system. Assuming therefore that it is common to the class to possess branchiæ of a laminated structure, symmetrically disposed, and concealed beneath the mantle, those genera which possess two such branchiæ will form an order under the term *Dibranchiata*, and the Pearly Nautilus and other cephalopods with shells of an analogous formation, a second order, under the term *Tetabranchiata*. It is in this sense that the expression 'Dibranchiate cephalopods' has been made use of in this memoir; and to this group most of the characters of the class, as given by the immortal Cuvier in his 'Règne Animal,' exclusively appertain.'

The preparation, No. 900, B. (*Physiological Series*) in the museum of the College of Surgeons, exhibits the circulation and respiratory organs of the species now under consideration. The branchial vessels are continued from a series at the lower part of the vena cava. They are four in number, corresponding to the four branchiæ, and have each three clusters of glandular follicles appended to them, representing the branchial auricles. The blood, after circulating through the branchiæ, is returned by four branchial veins, which open into the four corners of a transversely oblong ventricle. This has been laid open on the opposite side of the preparation to show the columnæ carneæ within. The blood is conveyed to the system in two arteries, one inferior and large, commencing by a muscular bulb, the other superior and small, which is seen partially injected with quicksilver. A branch of this artery winds over the ventricle, and is continued downwards into the membranous siphon, and a white bristle is passed through it along the pericardium, and through one of the apertures, by which the pericardium communicates with the branchial chamber. It is thus that the fluid contained in the siphon has an outlet, and on the supposition that the chambers of the shell contain gas, the sinking and rising of the Nautilus may be regulated by the varying proportions of gas and liquid in the chambered part of the shell. (*Cat.*)

We must refer the student for further and ample information to Mr. Owen's 'Memoir,' and the fifth and sixth plates illustrating it.

Nervous System and Organs of Sense.—This part of the system in the Pearly Nautilus is in many respects inferior to that of the Dibranchiate Cephalopods, though it is analogous to it. 'The part,' says Mr. Owen, 'which corresponds to the brain of the cuttle-fish, is neither enlarged nor lobulated, nor contained in a cartilaginous receptacle; but is a simple rounded chord or commissure placed transversely above the œsophagus, and connected at its extremities to the great ganglions. These are six in number; are disposed symmetrically about the œsophagus, and, together with the central commissure, are loosely enveloped in a tough membrane, or dura mater.' The double œsophageal collar is not peculiar to Nautilus, but is also found in other Mollusks, *Aplysia* for example; though in these latter cases the subœsophageal ganglions being more remote, the connecting filaments running to the common centre above are longer. The details of the nervous system are most clearly explained in Mr. Owen's Memoir, and beautifully displayed in the 7th plate. In the museum of the College of Surgeons the preparation (No. 1306, A, *Physiological Series*) exhibits the head and anterior or muscular part of the body of this species laid open longitudinally along the dorsal aspect, and the sides divaricated to show this part of the system. The brain, or supraœsophageal mass, will be seen to consist of a transverse chord-like ganglion, from the ends of which three nervous trunks are continued on each side. The anterior pair pass downwards and forwards by the sides of the œsophagus to unite below it, forming a ganglion on either side; these supply the digital processes and tentacles, and give off nerves to the organ of smell and the funnel. The middle and superior trunks dilate into the optic ganglions; the retina, which terminates that of the left side, is shown. The posterior chords surround the œsophagus in a manner analogous to the anterior pair, forming also two ganglionic swellings, from which the nerves of the great shell-muscles and those of the viscera are given off; the latter nerves are of small size, and are continued down by the side of the great perforated vein, and are analogous in their distribution to the sympathetic nerves and par vagum. (*Cat.*, vol. iii., part 1.)

Sight.—The eye of the Nautilus, as might be expected from the comparative inferiority of the brain, is less com

plex than in the Dibranchiate Cephalopods. 'Indeed,' says Mr. Owen, 'it appears to be reduced to the simplest condition that the organ of vision can assume without departing altogether from the type which prevails throughout the higher classes. For although the light is admitted by a single orifice into a globular cavity or *camera obscura*, yet the parts which regulate the admission and modify the direction of the impinging rays are entirely deficient.' The eyes are not situated in orbits, but are attached severally by a pedicle to the side of the head, immediately below the posterior lobes of the head. This attachment to a muscular pedicle gives great mobility to the organ, and enables the animal easily to bring it to bear on objects in a variety of directions. Mr. Owen found that the contents of the globe had escaped by the pupil; but he comes to the conclusion, on satisfactory grounds, that if it had ever contained a crystalline lens, it must have been very small.

Hearing.—Mr. Owen was unable to detect a distinct organ for this sense; but he is inclined to the opinion that there does exist in the Nautilus a distinct organ of passive smell, formed after the type of that organ in the inferior *Vertebrata*, and especially in fish.

Taste.—The structure of the tongue and the nerves with which it is supplied indicate a considerable development of this faculty; greater, Mr. Owen seems to think, than the analogous part in many of the *Vertebrata*.

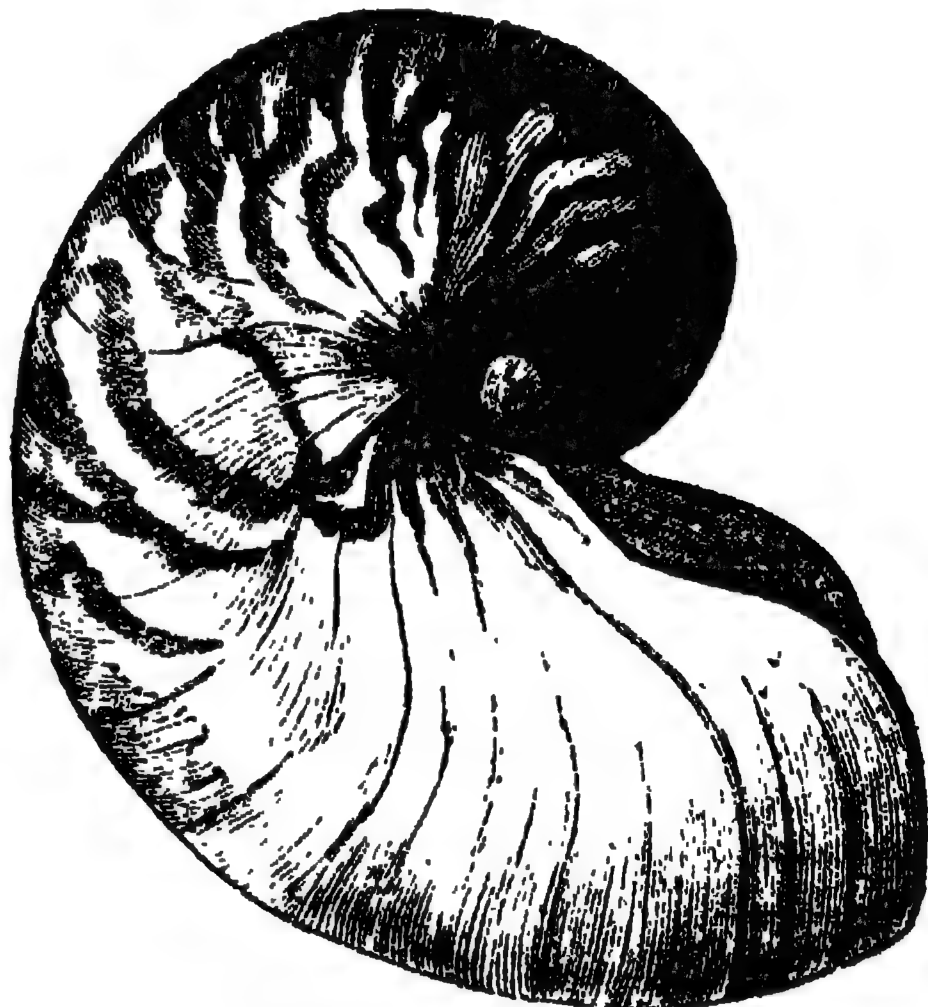
Touch.—Mr. Owen observes that the papillæ upon that part of the head which is termed the hood, if they could be proved to be endowed with nerves, would be peculiar to it among invertebrate animals; but he adds that the great difficulty experienced in tracing the nerves in the substance of the sheath renders their existence as nervous papillæ matter of conjecture only. The numerous tentacles however, soft in their texture, annulated on their surface, and well supplied with nerves, must give the animal an ample enjoyment of the sense of touch.

Generative System.—Aristotle was well aware of the distinctions of sex in the Μαλάκια; and Mr. Owen remarks that the propriety with which that great zoologist classed this animal, although it was covered with a shell to which it adhered like a snail, is fully borne out by the dissection of the female, upon which he operated. The organs consist of an ovary, an oviduct, and, as in the Pectinibranchiate Gasteropods, of an accessory glandular apparatus, and are delineated in the eighth plate of Mr. Owen's Memoir. No. 2651, A. in the *Physiological Series* of the Museum of the College of Surgeons, exhibits these organs. The single ovary is lodged in an appropriate peritoneal sac in the posterior part of the abdominal cavity. It is an oblong, compressed body, convex towards the lateral aspect, and on the opposite side having two surfaces sloping away from a middle longitudinal elevation. Its cavity is occupied by numerous ovisacs of different sizes, the largest of which appear to have recently discharged their contents. They present an elongated oval figure, and are attached by one extremity to the ovarian capsule, while the other floats freely in the ovarian cavity, and exhibits the rent by which the ovum has escaped. The ovisacs are smooth on their external surface, but present internally very numerous and minute wavy folds. They are principally attached along the line of the exterior elevated ridge, at which part the nutrient vessels penetrate the ovary. The oviduct is single, wide, and short; it is a continuation of the membranous external covering of the ovarium, the thick glandular and fibrous tunic of which presents, at the anterior extremity of the ovarium, a distinct perforation with plicated borders, which projects into the membranous commencement of the oviduct. At a short distance from this part a laminated glandular structure begins to be developed in the tunics of the oviducts, and increases in thickness to the external outlet of the canal. The eggs doubtless receive an outer covering from this gland, and a still more exterior nidamental coat, with probably also a connecting thread from the large laminated gland, which is here placed over the oviduct. This organ is situated, like the nidamental laminæ in the whelk, in the branchial chamber; it is adherent to the mantle, and gives rise to the two round convexities observable in the entire animal, in the ventral aspect of the body behind the infundibulum. It is a transversely oblong, trilobed mass, composed of numerous close-set pectinated laminæ, which are about a quarter of an inch in depth, and are disposed in three groups, forming the lobes of the gland; the laminæ of the larger group extend transversely across the middle line of the body, and have their free margins unprotected by a membrane; but the two smaller symmetrical groups have these margins covered by a thin membrane, which is reflected over them from the anterior margin of the glandular body; this is analogous to the detached laminated glands observable in the succeeding preparations. (*Cat.*, vol. iv.)

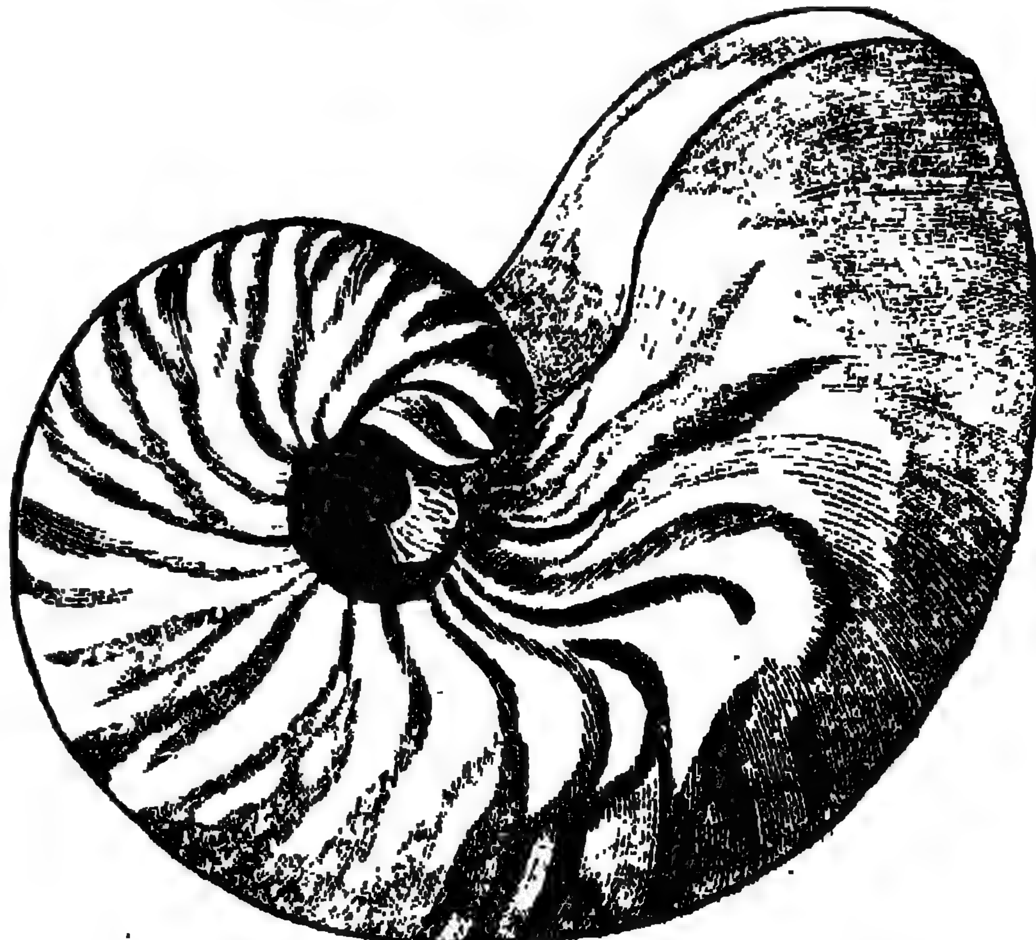
Habits.—Rumphius says of the Nautilus, 'When he floats on the water, he puts out his head and all his barbs (tentacles), and spreads them upon the water, with the poop (of the shell) above water; but at the bottom he creeps in the reverse position, with his boat above him, and with his head and barbs upon the ground, making a tolerably quick progress. He keeps himself chiefly upon the ground, creeping sometimes also into the nets of the fishermen; but after a storm, as the weather becomes calm, they are seen in troops floating on the water, being driven up by the agitation of the waves: whence one may infer that they congregate in troops at the bottom. The sailing however is not of long continuance; for having taken in all their tentacles, they upset their boat, and so return to the bottom.' (*Rariteit-Kamer.*)

Mr. Owen, who quotes this passage, observes that the extent to which the Pearly Nautilus is covered by its shell, and its close attachment to it, indicated the affinity to the Gasteropods in too strong a manner to escape the penetration of Aristotle, who, as we have seen, directly compares it in this respect to a snail; 'and the general resemblance,' says Mr. Owen in continuation, 'must have been sufficiently striking when, with his house above him and in the supine position, he makes his way along the sand with a moderate degree of rapidity.'

We here give representations of the external appearance of the shells of two species.



Shell of Nautilus Pompilius.



Shell of Nautilus scrobiculatus, or Umbilicated Nautilus.

The genus Nautilus is thus characterised by Mr. Owen *Body* oblong, rounded posteriorly, terminated by a slender

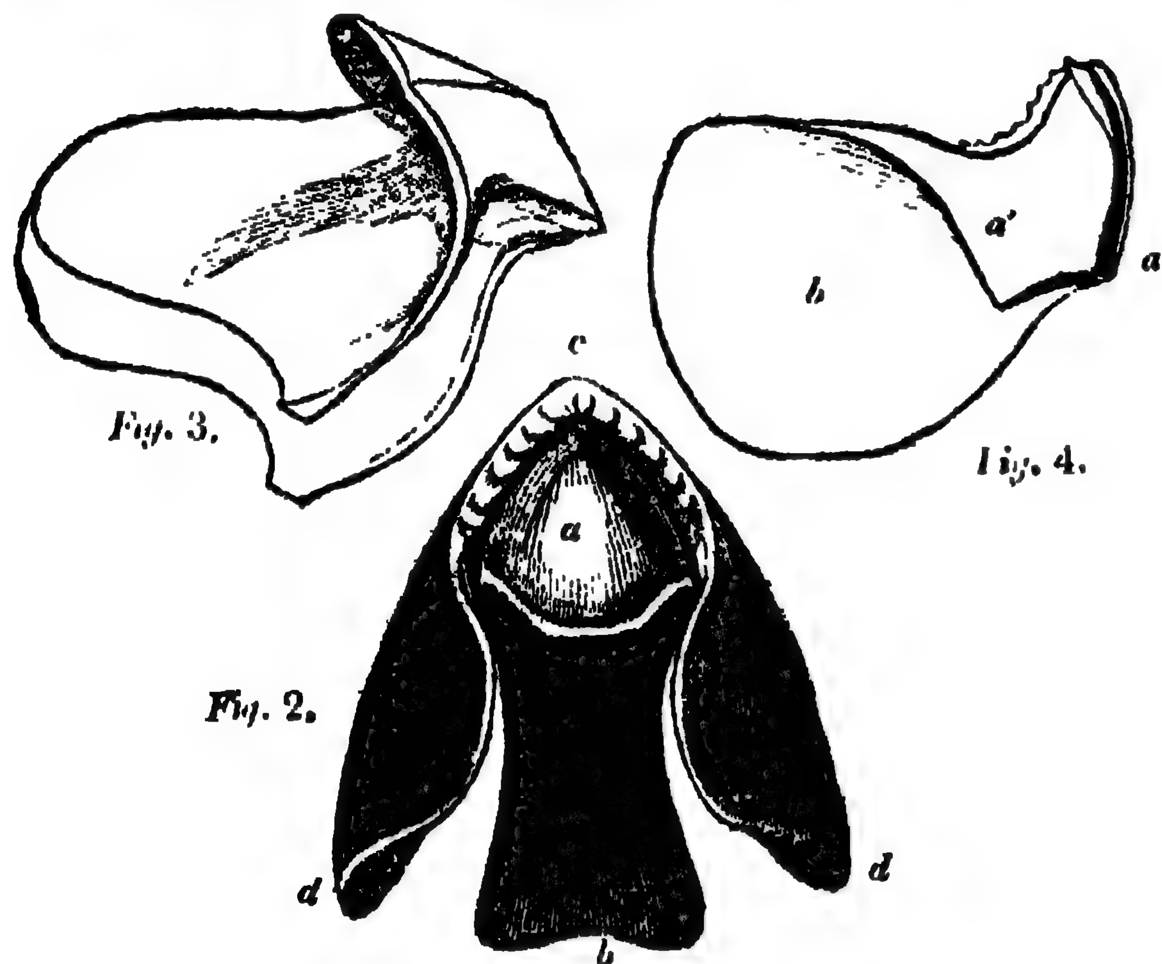
membranaceous tube. *Head* above with an ambulatory disk. *Arms* on each side, nineteen. *Tentaculiferous labial* appendages four, disposed around the mouth. Tentacles (ninety-two!) of three kinds, viz.: *Ophthalmic*, lamellose, on each side two; *Brachial*, annulose, on each side twenty; *Labial*, annulose, on each side twenty-four. The whole body laid up in the last chamber of a large multilocular shell, and affixed by two lateral muscles. [TETRABRANCHIATA.]

Geographical Distribution of the Genus.—The seas of warm climates, especially those of Asia and Africa, and their islands, Amboyna, Zanzibar, and New Guinea; and the Pacific and Australian Oceans.

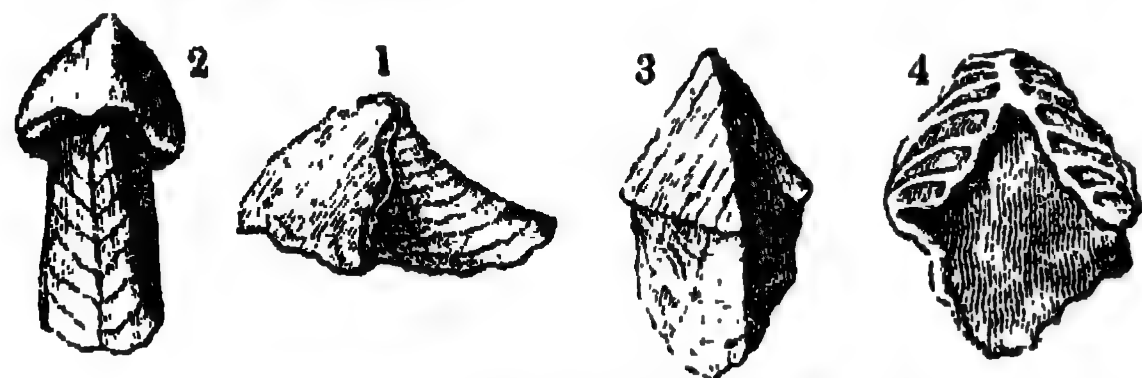
FOSSIL NAUTILI.

The *Rhyncholites*, formerly considered to be the beaks of birds, are now, upon unquestionable evidence, proved to be the jaws of fossil Nautili and Ammonites. Blumenbach recognised these *Rhyncholites* as being rather the mandibles of Cephalopods, differing from all recent genera then discovered; and M. d'Orbigny, who found some large ones in the same beds with the shell of a *Nautilus Gigas*, suspected that those Rhyncholites appertained to that species.

We here give figures of the mandibles or beaks of the Nautilus Pompilius, the structure of which is above noticed, and some of these *Rhyncholites*.



2, Mandibles of Nautilus Pompilius. *a*, calcareous extremity of upper mandible; *b*, extended internal horny laminæ of the same; *c*, notched calcareous extremity of lower mandible; *d, d*, external horny laminæ of the same. 3, Upper mandible, showing the form of the calcareous extremity, and the proportions of the external and internal horny laminæ. 4, One-half of the lower mandible, showing the different proportions of the two horny laminæ, and the extension of the horny substance at *a*, upon which the calcareous matter is deposited; *a'*, the internal horny lamina; *b*, the external horny lamina. Nat. size. (Owen.)



Rhyncholites, upper, side, and internal views.

1. Side view (muschelkalk of Luneville). 2, Upper view (same locality). 3, Upper view (lias of Lyme Regis). 4, Calcareous point of an under mandible, internal view, from Luneville. (Buckland.)

The oolite (Stonesfield), and the lias of Lyme Regis and Bath, will serve as examples of the British strata wherein these beak-stones occur.

Fossil Nautili occur both in the tertiary and subjacent strata. M. Deshayes (Tables) records four fossil species (tertiary). Dr. Mantell notices *Nautilus imperialis*, from the arenaceous limestone or sandstone of Bognor; *N. elegans*, from the chalk (Lewes); the last-named species and *N. expansus*, from the chalk marl; *N. inæqualis*, from the gault or Folkstone marl (Folkstone); and a nameless species, from the Shanklin sand (lower green-sand). Professor Phillips (*Yorkshire*) records the following:—*N. lineatus* (inferior oolite); *N. astacoides* (lias); *N. hexagonus* (Kelloways rock); *N. annularis* (lias); and others in the Speeton clay and Brandsby slate. Mr. Lonsdale (*Oolitic District of Bath*) enumerates *N. lineatus* (lias); and *N. obesus* (inferior oolite). Dr. Fitton (*Strata below the Chalk*) records *Nautili elegans, inæqualis, plicatus, radiatus, simplex, undulatus*, and an uncertain species, the first-named species from the upper and the rest from the lower green-sand. Mr. Murchison (*Silurian System*) describes and figures one species, *N. undosus*, from the Caradoc sandstone.

Dr. Buckland, who, in his 'Bridgewater Treatise,' gives a note describing the *Modus operandi* of the *Nautilus Pompilius* in swimming and sinking, thus concludes his observations upon the affinities of the chambered shells of *Cephalopods*.

'It results from the view we have taken of the zoological affinities between living and extinct species of chambered shells, that they are all connected by one plan of organization, each forming a link in the common chain which unites existing species with those that prevailed among the earliest conditions of life upon our globe; and all attesting the identity of the design that has effected so many similar ends through such a variety of instruments, the principle of whose construction is, in every species, fundamentally the same.

'Throughout the various living and extinct genera of chambered shells, the use of the air-chambers and siphon, to adjust the specific gravity of the animals in rising and sinking, appears to have been identical. The addition of a new transverse plate within the conical shell added a new air-chamber, larger than the preceding one, to counterbalance the increase of weight that attended the growth of the shell and body of these animals.

'These beautiful arrangements are, and ever have been, subservient to a common object, viz. the construction of *hydraulic instruments* of essential importance in the economy of creatures destined to move sometimes at the bottom and at other times upon or near the surface of the sea. The delicate adjustments whereby the same principle is extended through so many grades and modifications of a single type, show the uniform and constant agency of some controlling intelligence: and in searching for the origin of so much method and regularity amidst variety, the mind can only rest, when it has passed back, through the subordinate series of second causes, to that great first cause, which is found in the will and power of a common Creator.'

⁂ At page 109 (right-hand column) of this article, line 20 from the top, for 'hand' read 'hood.'

NAVAL ARCHITECTURE. [SHIP.]

NAVAN. [MEATH.]

NAVARETE, JUAN HERNANDEZ, was born at Logroño in Castile. He is commonly known by the name of *El Mudo*, from having been rendered deaf and dumb by an illness in the third year of his age. This misfortune probably led to the choice of a profession, in which he made such rapid progress in the school of Fr. Vicente, at Madrid, that he was soon able to visit Italy, and especially to study at Venice the works of Titian. After his return to Madrid in 1568, he was appointed painter to the king, for whom he painted his finest works, which are preserved in the Escurial. Among them are a small picture of the Baptism of our Saviour, the celebrated 'Presepio,'* in which the principal light proceeds from the infant, the 'St. Hippolytus, in search by night of the body of St. Lawrence,' and a Holy Family, generally considered as his masterpiece, in which the singularity of the accessories† attracted as much notice as the beauties of the composition. His works at Valencia, Salamanca, and Estrella are scarcely inferior to the preceding, and all are distinguished by a brilliancy of colouring which justly gained him the appellation of 'El Ticiano Español.'

He died in 1577, aged fifty-three years.

NAVARRETE DOMINGO FERNANDEZ, a learned Spanish Dominican of the seventeenth century, was sent in 1647 as missionary to the Philippine Islands, from whence he afterwards proceeded to China, where he remained many years, as head of the missions of his order, studying at the same time the language and the history of the country. He was at last put in prison by the Chinese authorities, but succeeded in escaping to Macao, from whence he returned to Europe in 1673. He gave to the pope an account of the missions in China, in which he exposed the latitudinarianism of the Jesuits in accommodating themselves to

* Presepio, a stable; a term applied by the Spaniards to that in which our Saviour was born.

† A cat, a dog, and a partridge. They were perhaps the cause of his being obliged to bind himself in a contract with King Philip not to introduce cats, &c., again in such subjects: 'Y en las dichas pinturas non pongo, gato, ni perro, ni otra figura que sia deshonesta.'

several of the superstitions of the natives, in order to increase the number of their pretended converts. This practice had already been denounced by Morales, another Dominican, and condemned by a papal decree of the 12th of September, 1645, of which Morales was the bearer to China. The Jesuits however, having obtained from Rome several modifications of this decree, persisted in their practices, which Navarrete himself appears to have winked at while in China.

On his return in 1673, Navarrete went to Rome, where he was well received by the pope. In 1678 he was appointed archbishop of Santo Domingo in the West Indies, where he died in the following year.

Navarrete wrote a work in Spanish, which has become very scarce, on the history and the moral and political condition of China, the first volume of which was published at Madrid in 1676; but the second volume, which contained an account of the disputes between the Jesuits and the Dominicans in China, is said to have been suppressed by the Inquisition. This work is entitled 'Tratados historicos, politicos, ethicos, y religiosos de la Monarchia de China,' fol., Madrid, 1676. It contains many curious particulars. At the end of the first volume are several decisions and decrees of the popes concerning the regulation of the Chinese missions.

NAVARI'NO, called *Neocastro* by the Greeks, a small town and fortress of Morea, built on the south coast of the bay of the same name, about five miles north of Modon, and about three miles measured across the bay from old Navarino, which is a ruined town with an old fort of the middle ages, built on a steep hill on the northern coast of the bay, near the site of antient Pylos, which, according to Pausanias, was situated on the promontory Coryphasium. But there was another Pylos in Eleia, and a third one in Tryphylia, and all three claimed the honour of being the Pylos of Nestor. The Messenian Pylos was deserted by its inhabitants in the second Messenian war. It seems however to have revived afterwards, and Pausanias (*Messen.*, 36) speaks of it as an inhabited place, and mentions a temple, a monument of Nestor, and other antient buildings existing in his time, of which no traces now remain. (Leake's *Morea.*) The island of Sphacteria, or Sphagia, lies across the entrance of the bay, and adds to its security, rendering it one of the best harbours in the Levant. Sphacteria is known in antient history for the defeat and capture of the Lacedæmonians by the Athenians, in the seventh year of the Peloponnesian war. (Thucyd., iv. 39.) [CLEON.] In modern times the bay of Navarino has become memorable for the naval battle which took place on the 20th October, 1827, between the French, English, and Russian combined fleet on one side, and the Turco-Egyptian fleet which was anchored in the bay on the other. The English had three ships of the line and four frigates, the French three ships of the line and two frigates, and the Russians four ships of the line and four frigates. The Ottomans had three ships of the line and twenty-five frigates, besides smaller vessels. Admiral Codrington had the command of the combined fleet, and his object was to oblige Ibrahim Pasha to evacuate the Morea. After some desultory negotiations and some evasions on the part of Ibrahim, Admiral Codrington resolved to attack Ibrahim's fleet. After a warm resistance, the Turco-Egyptians were completely defeated, with the loss of three ships of the line, four frigates, and about forty or fifty smaller vessels. The rest surrendered, and a convention followed by which Ibrahim evacuated the Morea, and the Greek prisoners whom he had sent to Egypt were restored to their country. The Egyptian ships which had not been destroyed were returned to the Pasha of Egypt. The battle of Navarino decided the independence of Greece.

The justice of the attack made by the combined fleets on the Turco-Egyptians at Navarino has been questioned on the ground of international rights, supposing those rights to be applicable to a semi-barbarous power as the Turks then were, which had frequently and unscrupulously violated them. The policy of the attack has also been questioned in reference to the national or individual interests of England and France. But one thing may be safely asserted in favour of the battle of Navarino: it fully attained the object for which it was fought—the emancipation of Greece. Unlike many other battles which have proved a useless waste of human lives, that of Navarino established the independence of a country and put an end to a murderous warfare. In this respect it may be compared to the battles of Trafalgar and Waterloo in our own times, as the former may be said to have put an end the maritime contest of France against England, and the second effectually terminated the Continental war. Before the battle of Navarino, the Greeks were obviously unable to drive the Ottomans and Egyptians out of their country, whilst at the same time they were determined not to submit; the contest had lasted seven years, and it could never have been terminated except by the extermination or transportation of the Greek population, measures which had begun to be carried into effect on a large scale by Ibrahim in the Morea. But the extermination of a whole people and the slavery and sale of the women and children are things which will not be tolerated in Europe at the present day.

NAVARRA (Navarre), a kingdom or province of Spain, lying between 41° 58′ and 43° 17′ N. lat., and between 43 and 2° 27′ W. long. It is bounded on the north by France, on the east by Aragon, on the south by the province of Soria in New Castile, and on the west by the provinces of Guipuzcoa and Alava in Biscay. In shape it is an irregular quadrilateral, about 80 miles in extreme length from north to south, and 64 in its greatest breadth from east to west. Its area is nearly 2500 square miles, and its population now 271,000; by the census of 1788 it was estimated at 288,000, of whom 3550 were priests, monks, and nuns, 9910 servants, and 13,054 nobles.

Three-fourths of the surface of Navarre are mountainous; the remaining fourth consists of a few large valleys and some small fertile plains. The grand chain of the Pyrenees, which forms the northern frontier, sends off numerous other chains, which gradually decrease in height as they approach the south. The loftiest mountain, Altobiscar, attains the height of 5380 feet above the sea. Adi is 5218 feet high, and Alcorrunz, Arza, and La Runa are all considerably above 3000 feet. That part of the province which borders on France is very rugged, barren, and thinly peopled, excepting however the valleys of Baztan, Santistevan de Lerin, and las Cinco Villas de Navarra (Lesaca Vera, Sumbilla, Echalar y Aranaz), a rich and delicious country. The southern part is much more level and fertile, and better inhabited.

The principal river is the Ebro, which, for nearly 40 miles, forms the southern boundary of the province; its tributaries are the Borunda, Ega, Arga, Aragon, Irati, Salazar, and Esca, all flowing from the north; and the Queilas and Alhama from the south. The extreme north of the province is watered by the Bidasoa, which rises in the Pyrenees, and empties itself into the Bay of Biscay at Fuenterrabía. Besides these rivers Navarre is watered by innumerable small streams, many of which, being formed wholly of melted snow, are dried up by the summer heats. The climate of the northern districts is exceedingly cold in winter, and rarely subject to excessive heat in summer; in the south it is far more genial, and highly delightful and salubrious. The soil in the low grounds is very rich, and susceptible of a higher degree of cultivation than it has received: there is also much fine pasture-land. The principal valleys are, Baztan in the north, containing fourteen villages and 7500 inhabitants, very fertile in fruit and maize, and abounding in cattle; that of Roncesvalles, renowned in history for the defeat of Charlemagne and his twelve peers, in 778; and those of Lescou, Roncal, Baigorri, Salazar, and Aezcoa.

Navarre, from its mountainous character, is by nature almost isolated from the countries around it. In the northern frontier there are ten passes; the five principal are those of Vera, Maya, Roncesvalles, Ochagavia, and Isava. On the sides of Biscay and Aragon the approaches are more difficult of access; and on the side of Castile the deep and rapid Ebro forms a barrier passable only by the three bridges of Logroño, Lodosa, and Tudela. The roads which traverse the province are excellent.

Of the geology of Navarre little is known. The mountains are mostly of transition and secondary rocks; jasper and marbles are also found. There are many mines of iron and one of copper; one also of rock-salt near Valtierra, yielding annually about 298,000 lbs., and several hot springs.

Forests of pines (pinus sylvestris) cover the slopes of the Pyrenees, and much wood is cut and sent down by the mountain streams to the Ebro, by which it is floated onward to Aragon and Cataluña. The other principal forest trees are the oak, evergreen and deciduous, the olive, the chesnut, the beech, and box. The forests are not extensive, yet

Navarre yields more valuable timber than any other province of Spain. Heaths, ferns, and broom, with many aromatic plants, grow on the mountains. Of grain Navarre yields annually 3,452,800 bushels, of which about 2,053,550 are of wheat, 303,850 of maize, 673,200 of barley, 308,000 of oats, 70,850 of rye, and the remainder of spelt-wheat. Of vegetables (including chesnuts) the annual quantity is about 197,600 bushels, of which the principal part are broad and kidney beans. The annual produce of hemp is 600,000 lbs., of flax 200,000 lbs., of olive-oil about 130,000 gallons, and of wines, which are excellent, and of various descriptions, about 10,500,000 gallons. After a rich vintage people are invited by the public crier to take the old wine away from particular vaults gratis, in order to make room for the new. The old wine is even wasted sometimes, and allowed to run down the streets. A small quantity of cyder is also produced in the Baztan and Cinco Villas.

According to Miñano, there are in Navarre about 38,000 head of horned cattle, 630,000 sheep, 70,000 goats, 32,000 pigs, and 26,000 mules. The annual produce of wool amounts to 1,412,000 lbs. The mountains abound in game and the rivers in fish. The average value of all the natural productions of Navarre, animal, vegetable, and mineral, Miñano estimates at nearly 1,500,000*l*. The wild animals are wolves, foxes, and wild boars in the Larraun Mountain.

The manufactures of Navarre are inconsiderable. There are 634 factories of coarse linen, 319 of woollen cloth, 67 of leather, 12 of soap, 30 of iron, and of brandy the quantity annually distilled averages 2,000,000 gallons. Besides these are some potteries, a royal shot and shell foundry, and some manufactories of Spanish liquorice. At the commencement of the present century the average value of manufactures was 142,600*l*. per annum.

The greater part of the produce, natural and manufactured, is consumed in the province, but about 30,800 English bushels of grain, a little oil, half the wine, the greater portion of the wool, and two-thirds of the iron annually remain unconsumed, and are exported, which however fall very far short in amount of the cottons and silks, cutlery, tobacco, sugar, spices, and other luxuries imported, principally from France.

Navarre is divided into five districts, or *merindades*, as they are called, viz. that of Pamplona in the north, of Tudela in the south, Sangüesa in the east, Estella in the west, and Olite in the centre. Each *merindad* has a capital town of the same name. The kingdom contains 9 cities, 145 towns, 675 villages, with a total of 38,289 houses. It has two bishoprics, those of Pamplona and Tudela; 753 parishes, 70 convents and hermitages, 1 university, 4 colleges, and 12 hospitals.

The metropolis is Pamplona, situated on an eminence on the left bank of the river Arga, in the midst of a small, fertile, circular plain, called La Cuenca, enclosed by lofty mountains. It was antiently the court of the kings of Navarre, is still the residence of the viceroy of the province, the seat of administration, and see of a bishop, suffragan of Burgos. It is divided into twenty wards, and contains a cathedral (a neat Gothic edifice of great antiquity, disfigured by a modern façade), 4 parish churches, 7 convents of monks and 2 of nuns (suppressed in 1835, because under the authority of the queen), a royal and an episcopal palace, a senate-house, a town-hall, a mint, a public granary, a university, an hospice, a foundling hospital, a theatre, 41 inns, 1632 private houses, and a population of 15,000. The city, including the citadel, measures 960 yards from north to south, and 1633 from east to west. It is ill built, but contains a few handsome houses; the streets are narrow, but well paved, and kept thoroughly clean by means of sewers. There are 3 large and 3 small squares, in the largest of which bull-fights are occasionally held, 6 public fountains, and an aqueduct, by which the city is supplied with water from the mountain of Subiza, twelve miles distant. Pamplona is well fortified; the citadel is a regular pentagon, of 1000 feet each side: it was built by Philip II. There is a beautiful promenade, called Taconera, within the walls, and three others without. The manufactures of Pamplona are very trifling, namely, two tanneries, two factories of wax, one of woollen cloth, and one of guitar-strings, besides a paper-mill and six corn-mills on the Arga. Its commerce is confined to the importation of woollen and silken goods, principally from England and France; but some cloth is imported from Castile, serges and silk from Aragon, and a little Indian silk from Cataluña.

Pamplona is called Pompelon by Strabo (161. *Casaub.*), who adds, 'as if it might be Pompeiopolis,' that is, the city of Pompey. The people are called Pompelonenses by Pliny (iii. 3). The name of the city was corrupted by the Arabs, who took it in the beginning of the eighth century, into Bamblona. In 778 it was destroyed by the French, but afterwards rebuilt. In 907 it was besieged by the Moors, and in 1138 by the Castilians, but on both occasions it maintained a successful resistance. In 1277 it was again taken by the French. In 1512 it was blockaded and taken by the duke of Alba, general of Ferdinand the Catholic. In 1808 it was seized by the French, who had been allowed to enter as friends; in 1812 blockaded by Mina; and in 1813 it capitulated to the allies under the duke of Wellington, after the battle of Vitoria.

The city next in importance is Tudela, situated on the right bank of the Ebro, which is here crossed by a very fine bridge of seventeen arches and 1200 feet in length. It has a cathedral, 10 convents (lately suppressed), 2 hospitals, and a population of 8150. The streets are narrow and crooked, but well cleansed; the houses are lofty, and all contain fountains. About two miles east of Tudela is the commencement of the canal of Aragon, which, when finished, will connect Navarre with the Mediterranean.

The other cities are—Estella, a town lately fortified by the Carlists, with 4600 inhabitants, recently the stronghold of Don Carlos; Olite, with 5000 inhabitants, celebrated for its salubrious climate, and at one time the residence of the kings of Navarre; Corella, with 4000; Tafalla, with 2800; and Sangüesa, with 2500 inhabitants.

The political constitution and laws of Navarre are still the same which it enjoyed when an independent monarchy, and differ altogether from those of the rest of Spain. It is governed by a viceroy, who presides at the royal council, the supreme tribunal for civil and criminal causes. The legislative body is composed of the three estates of the kingdom: the clergy, who attend by right of their station; the nobility, by right of birth; and the deputies, who are elected by the people. Navarre enjoys also peculiar fiscal privileges.

The inhabitants of Navarre are tall, well made, muscular, very hardy and brave, independent in spirit, strongly attached to their government and religion, and jealous of their privileges. The guerrilla bands under Mina proved most formidable opponents to the French in the War of Independence. The Navarrese are also grave and reserved, but witty and shrewd, obstinate and quarrelsome, and yet industrious and honest.

Castilian is the general language of the province, but the Basque, or a mixture of these two languages with French, is spoken in some districts.

The earliest inhabitants of Navarre were called Vascones by the Romans. In A.D. 470 they were subdued by the Goths. Early in the eighth century Navarre was conquered by the Arabs; but the Christian inhabitants who had fled to the recesses of the Pyrenees, resolving to expel the invaders, chose a noble knight, Garci Ximenez, for their chieftain or king; and thus was founded the monarchy of Navarre. His family became extinct in the middle of the ninth century, and the Navarrese then elected Iñigo Sanchez, count of Bigorre, in the hands of whose descendants the sceptre of Navarre remained for five centuries. In 1512 Ferdinand the Catholic obtained possession of that part of the antient kingdom of Navarre which forms the present province, and annexed it to the Spanish dominions, leaving unconquered the portion on the northern side of the Pyrenees, which was afterwards united by Henri IV. to the crown of France, and is now known as the department of the Lower Pyrenees. On the invasion of Spain by Bonaparte, Navarre eminently distinguished itself by its obstinate resistance: and it has recently attracted the eyes of all Europe as being, with Biscay, the principal theatre of the civil contest between Don Carlos and Isabel II. of Spain.

(Miñano, *Dic. Geog.*; Laborde, *Itinéraire Descriptif de l'Espagne*; Antillon, *Geografia de España y Portugal*, 1824; Bowles, *Introduccion á l'Historia Natural de España*; Cook's *Sketches in Spain*; Mariana, *Historia General de España*; Conde's *Arabes*, &c.)

NAVARRE, BASSE. [PYRENEES, BASSES.]

NAVE. [CHURCH.]

NAVICELLA. [NERITIDÆ.]

NAVIGATION. [COMPASS; LONGITUDE AND LATITUDE, METHODS OF FINDING; MERCATOR'S PROJECTION; SAILING.]

NAVIGATION LAWS. [SHIP and SHIPPING.]

NAVIGATOR'S ISLANDS, a group of islands, situated in the Pacific, between 10° and 15° S. lat. and 185° and 195° E. long., consists of nine islands, of which the largest, called Pola, or Chatam, is the most western. It is twice as large as Otahiti, and not inferior in fertility and beauty. From east to west it measures about 45 miles. Eastward of Pola are Ojalava and Mouna, which are hardly inferior in size. The other six islands are small. They all appear to be volcanic; all the rocks of the beach, upon which the sea breaks with such force as to throw the water more than fifty feet high, are only pieces of lava, rounded basalts, or coral, by which the islands are wholly surrounded. In the coral reefs are narrow passages for boats. Along the beach are level tracts, but at some distance the country rises into hills and mountains. The islands are clothed even to the very summits of the hills with trees loaded with fruit, and are very populous. They abound in pigs, dogs, fowls, birds, and fish, and the lower parts are covered with extensive plantations of guavas, bananas, and other fruits. The sugar-cane grows spontaneously on the banks of the rivers. The inhabitants belong to the Malay race, and speak a language which is a dialect of that used in the Friendly Islands. They are averse to the visits of Europeans, and much inclined to quarrel with them. (La Perouse's *Voyage round the World*.)

NAVY. Before we describe the present constitution and force of the British navy, we shall give a short sketch of the rise and progress of that vast machine, to which England is so much indebted for the power and prosperity which she enjoys, commencing with the origin of naval enterprise among our barbarian ancestors.

All nations inhabiting the shores of the sea or navigable rivers possessed from the earliest period vessels of a rude construction. But these were so inadequate to withstand the winds and waves in our northern seas, that it was not until the reign of the emperor Probus, A.D. 276-82, that the veil of terror hanging over the ocean and distant voyages was removed. That emperor, in pursuance of his plan of colonising the border lands, which were exhausted by war, with people from the crowded countries of the barbarians, had carried a party of Franks into Pontus, with a view of defending that country against the Alani. Love of home induced some of these people to attempt their return; they seized ships on the Euxine, and plundered the coasts of Greece, Asia, and Sicily, either to supply their wants or for revenge: passing the Pillars of Hercules, they veered to the right, and completed their voyage by disembarking at the mouth of the Rhine. From this voyage we may date the origin of nautical enterprise. The Saxons took advantage of the rich harvest thus opened to all who would attack the Roman provinces by sea, and ravaged the coasts to such an extent as to oblige the Romans to establish a fleet in the English Channel to repel them. After the Saxons had been long in possession of England, they lost their naval arts, and in their turn became a prey to the constant attacks of the Sea-kings, Vikingr, and other pirates. We have no record of the size or number of the vessels which sustained so many conflicts with the Danes in the ninth century. Alfred the Great was the founder of the English navy. He first perceived the necessity of a fleet to protect the coasts from the swarms of pirates in the northern seas. A slight advantage gained by some ships of his over the Danes, in 876, induced him to build long ships and galleys, which, as his countrymen were not competent to manage them, he manned with such piratical foreigners as he could engage. After he had driven out the Danes, he applied his talents to improve his ships, and built vessels higher, longer, and swifter than before, some rowing thirty pairs of oars, others more. Ethelred made a law that whoever was lord of 310 hydes of land should furnish and build one vessel for the service of the country.

William the Conqueror established the Cinque Ports, and gave them certain privileges on condition of their furnishing 52 ships for 15 days, in case of emergency. King John claimed for England the sovereignty of the seas, and declared that all ships belonging to foreign nations, which should refuse to strike to the British flag, should be deemed fair and lawful prize. In the year 1293, an English sailor having been killed in a French port, war ensued, which it was agreed to settle by a naval action, which was fought in the middle of the Channel, and the English, being victorious, carried off above 250 sail. In 1340, when King Edward III. with 240 ships was on his voyage to Flanders, he fell in with and completely defeated, off Sluys, the French fleet of 400 sail, manned with 40,000 men. The same monarch blockaded Brest with 730 sail, containing 15,000 men. Many of the ships composing these fleets were Genoese and Venetian mercenaries, but they must have been very small, and the numbers of ships and men are probably exaggerated. Henry V. had something of a navy, for we find among the records in the Tower, a grant under his hand of annuities to 'the maistres of certaine of our owne grete shippes, carrakes, barges, and ballyngers.' Henry VII., who succeeded in 1485, seems to have been the first king who thought of providing a naval force which might be at all times ready for the service of the state. He built the Great Harry, properly speaking the first ship of the royal navy; she cost 15,000*l.*, and was accidentally burnt in 1553. Henry VIII. perfected the designs of his father. He constituted the Admiralty and Navy Office, established the Trinity House, and the dockyards of Deptford, Woolwich, and Portsmouth; appointed regular salaries for the admirals, captains, and sailors; and made the sea service a distinct profession: he also made laws for the planting and preservation of timber. In 1512, when a fleet was fitted out against France, under Sir Edward Howard, lord-high-admiral, the following allowances were made:—

	s.	*d.*
For his own diet, maintenance, wages, and rewards, per diem . . .	10	0
Each captain for ditto, ditto . .	1	6
Every soldier, mariner, and gunner, for his wages per lunar month . .	5	0
And for his victuals . . .	5	0

The ships of this period were high, unwieldy, and narrow; their guns were close to the water, and they had lofty poops and prows, like Chinese junks, insomuch that Sir Walter Raleigh informs us 'that the Mary Rose, a goodly ship of the largest size, by a little sway of the ship in casting about, her ports being within 16 inches of the water, was overset and sunk.' This took place at Spithead in the presence of the king, and most of her officers and crew were drowned. The Henri Grace de Dieu, the largest ship built in this reign, is said to have measured above 1000 tons. At the death of Henry VIII., the tonnage of the navy was 12,000 tons. Elizabeth increased the navy greatly. The fleet which met the Spanish Armada numbered 176 ships, manned by 14,996 men; but these were not all 'shippes royal,' for she encouraged the merchants to build large ships, which on occasion were converted into ships of war, and rated at 50 to 100 tons more than they measured. She raised the wages of seamen to 10 shillings per month. Signals were first used in this reign as a means of communication between ships. In 1603 the navy had 42 ships, measuring 17,000 tons. In the reign of James I. lived the first able and scientific naval architect, Phineas Pett, and the king had the good sense to encourage him. Pett introduced a better system of building, and relieved the ships of much of their top hamper. Before the civil wars broke out, Charles I. built the Sovereign of the Seas, of 100 guns, and measuring 1637 tons. In this reign the navy was first divided into rates and classes. Cromwell found the navy much reduced, but his energy restored it, and he left 154 sail, measuring 57,643 tons, of which one-third were two-deckers. Cromwell first laid before parliament estimates for the support of the navy, and obtained 400,000*l.* per annum for that purpose. The navy flourished under Charles II., with the duke of York at its head, assisted by Samuel Pepys, as secretary, until 1673, when the duke's inability to take the test oath caused his retirement, and the king's pecuniary difficulties leading him to neglect the navy, it fell into decay. The duke of York was recalled to his post in 1684, and at his accession in the following year there were 179 vessels, measuring 103,558 tons. James II., on coming to the throne, took active measures for the restoration of the navy; he suspended the Navy Board, and appointed a new commission, with which he joined Sir Anthony Deane, the best naval architect of the time, who essentially improved the ships of the line by copying from a French model. Four hundred thousand pounds per annum were set apart for naval purposes, and so diligent were the commissioners that at the Revolution the fleet was in excellent condition, with sea stores complete for eight months for each ship. The force was

154 vessels, carrying 6930 guns, and 42,000 men, whereof nine were first-rates.

King William immediately on being placed on the throne went to war with France, whose navy was then very powerful; in 1681 it consisted of 179 vessels of all sorts, carrying 7080 guns, besides 30 galleys. An act was passed in his second year, for building 30 ships, to carry 60, 70, and 80 guns respectively. The dockyard at Hamoaze, out of which has since grown the considerable town of Devonport, which now returns two members to parliament, was then established. Queen Anne found at her accession the navy to consist of 272 vessels, measuring 159,020 tons, but this estimate includes hulks, hoys, and other vessels not carrying guns. In 1704 one of the greatest and most destructive storms ever known took place. It began in the middle of November, and did not attain its greatest height till the 27th. The Eddystone lighthouse was destroyed, no less than 10 men-of-war were totally lost, and many more were driven on shore and damaged. All measures adding to the strength and efficiency of the navy were exceedingly popular during this reign. We find at the death of Anne in 1714, that the number of ships was less, but the tonnage increased, being ships 198, guns 10,600, tons 156,640. The parliamentary vote of that year was 245,700*l.* and 10,000 seamen and marines. During the first four years of George I., large sums were voted for the extraordinary repairs which were required after the long war. A new establishment of guns also was ordered in this reign. The navy remained stationary till 1739, when hostilities commenced against Spain, and the navy was augmented, particularly in the smaller classes, and the dimensions of several classes were enlarged. War broke out with France in 1744, at which period there were 128 sail of the line. At this time all prizes taken by H.M.'s ships were declared to be the property of the captors. In 1747 a naval uniform was first established. The navy increased vastly during this war, in which 35 sail of the line were taken or destroyed by the English. George III. at his accession found the navy to consist of,

Ships of the line . . .	127	measuring 321,104 tons.
50 guns and under	198	

The vote for the year 1760 was 432,629*l.*, and 70,000 seamen and marines. In the short war of 1762, 20 sail of the line were added to the navy, and at the end of the American revolutionary war it was composed as follows:—

Sail of the line . .	171	about 500,000 tons.
Under	203	

The navy was kept in a high state of preparation, and when, on the 1st of February, 1793, the French republic declared war against England, this country was not unprepared. A period now commences in which the gigantic efforts made by England, and the protection necessary for a mercantile marine, which almost monopolised the commerce of the world, raised the British navy to such a height as to enable it single handed to maintain the sovereignty of the seas against all other navies combined. Sir Charles Middleton, afterwards Lord Barham, had, when comptroller of the navy in 1783, established the regulation that a great proportion of stores, sails, &c. should be laid by for each ship in ordinary; so that in a few weeks after the declaration of war there were 54 sail of the line and 146 smaller vessels at sea. The vote for the service of the navy was 5,525,331*l.*, 85,000 seamen and marines. The navy of France had never been so powerful: it amounted to above 200 vessels, of which 82 were of the line and 71 in addition were immediately ordered to be built. The English had about 115 sail of the line fit for service, but the majority of the French ships were larger and finer, and carried heavier guns on their lower or principal battery. The following abstract will show the losses on both sides up to the peace of Amiens, exclusive of the casual losses.

	Captured.	Destroyed.
British ships of the line .	5	..
Smaller vessels .	37	9
Total	42	9
French ships of the line	32	11
Dutch do.	18	0
Spanish do.	6	5
Danish do.	2	0
	58	16
French smaller vessels .	266	44
Dutch do. .	62	6
Spanish do. .	57	10
Total	443	76

This estimate does not include 807 privateers, chiefly French, taken and destroyed. Of the above, 50 sail of the line and 94 under that size were added to the British navy.

During the peace of Amiens preparations for war were actively continued on both sides, and the declaration on the part of England was made in the month of May, 1803, at which time the navy was of the following force, as compared with 1793:—

	Ships of line.	Under.	Tons.
1793 . .	153 . .	411 . .	402,555
1803 . .	189 . .	781 . .	650,976

Notwithstanding the apparent increase, there were not so many line-of-battle ships fit for sea at the latter as at the former period by about ten. The French force in serviceable line-of-battle ships in March, 1803, was 66, the British 111. During this war there were employed from 100,000 to 120,000 seamen and marines till 1810, when the number was increased to 145,000. There were about 100 sail of the line, 150 frigates, and above 200 sloops, besides small armed vessels, amounting in the whole to about 500 sail of pendants constantly employed. The following abstract shows the losses on each side during the war:—

	Captured.	Destroyed.
British—Ships of line .	0	0
Under . .	83	7
	83	7
Enemies'—Ships of line	55	14
Under .	79	23
	134	37

of which 33 sail of the line and 68 under were added to the British navy.

In George III.'s reign the dockyard of Pembroke was established.

The parliamentary vote for the service of the navy, 1839-40, was as follows:—

Officers .	3,400	For the effective service	£3,492,132
Petty do.	3,998	For the non-effective do.	1,488,221
Seamen .	12,846	Other departments, viz., convicts and transport of troops . . .	217,158
	20,244		
Marines	9,000		
	29,244	Total charge .	£5,197,511

The following tables will show the force of the British navy at three distinct periods, viz.: the breaking out of the French revolutionary war; a few years subsequent to the peace; and the present time: also the disposition of the British naval force at the present time, as well as the naval force of other countries possessing a navy.

RATE.	1793. In Commis.	1793. In Ordinary.	1793. Building.	1793. Total.	1820. In Commis.	1820. In Ordinary.	1820. Building.	1820. Total.	1839. In Commis.	1839. In Ordinary.	1839. Building.	1839. Total.
First	1	2	2	5	2	14	7	23	4	14	6	24
Second	4	12	5	21	1	8	12	21	5	10	11	26
Third	21	70	5	96	11	69	3	83	15	31	2	48
Of the Line . .	26	84	12	122	14	91	22	127	24	55	19	98
Fourth	7	5	3	*15	7	7	7	21	2	15	2	19
Fifth	35	44	3	82	14	67	25	106	8	53	8	69
Sixth	15	20	..	35	14	7	18	39	21	3	4	28
Sloops	34	13	2	49	49	62	84	145	45	10	13	68
Steam-vessels . .	..	..	..	..	..	..	..	..	†30	4	10	44
Gun-brigs, Schooners, Cutters . .	18	..	..	18	15	10	2	27	‡45	9	12	66
Grand Total .	135	166	20	321	113	244	108	465	175	149	68	392

* In 1793 the fourth-rates on two decks formed part of the line of battle.

† Of these steam-vessels only seven appear to be adapted for war; the remainder are employed in carrying despatches, troops, &c. There are besides 30 steamers, not entered here, which are employed in the packet-service in Great Britain.

‡ There are also 23 sloops fitted for foreign packets, whose station is at Falmouth.

STATION.	First Rates.	Second Rates.	Third Rates.	Fourth Rates.	Fifth Rates.	Sixth Rates.	Sloops.	Steam Vessels.	Brigs, Schooners, &c.
Portsmouth . . .	1	.	2	.	.	.	2	2	3
Plymouth . . .	1	.	2	.	1	.	1	.	.
Rivers Thames & Medway	1	1	1	1	.	1	2	7	3
Mediterranean . .	1	3	5	.	1	5	4	7	2
North America and West Indies . . .	.	.	1	.	4	4	13	6	4
South America . .	.	.	.	1	1	4	6	.	7
East Indies . . .	.	.	1	.	.	2	6	.	2
Cape of Good Hope and Coast of Africa . .	.	.	1	.	.	.	5	.	15
Lisbon	.	1	2	.	.	1	1	.	1
Lakes of Canada . .	.	.	.	.	.	1	.	3	1
Surveying . . .	.	.	.	.	.	.	4	1	4
Particular Service . .	.	.	.	.	.	2	1	3	3
Troop Ships . . .	.	.	.	.	1	1	.	1	.
Packets	.	.	.	.	.	.	.	30	23
Total in Commission .	4	5	15	2	8	21	45	60	63

Ships of the Line.	France. In Commis.	In Ordinary.	Building.	Total.	Russia. In Commis.	In Ordinary.	Building.	Total.	America. U. S. In Commis.	In Ordinary.	Building.	Total.	Egypt. In Commis.	In Ordinary.	Building.	Total.	Turkey. In Commis.	In Ordinary.	Building.	Total.	Holland. In Commis.	In Ordinary.	Building.	Total.
100 guns and upwards .	2	4	16	22	5	.	2	7	2	.	.	2	6	2	1	9	2	1	.	3	.	.	.	.
80 to 100 guns	5	2	11	18	16	2	5	23	.	2	8	10	2	.	.	2	5	1	.	6	.	2	.	2
70 to 80 guns	3	4	2	9	19	1	.	20	.	3	.	3	1	.	.	1	3	3	.	6	.	3	3	6
Of the Line .	10	10	29	49	40	3	7	50	2	5	8	15	9	2	1	12	10	5	.	15	.	5	3	8
Frigates. Razees and 60 guns .	5	8	9	22	4	.	.	4	6	9	18	33	7	.	.	7	4	1	1	6	.	2	2	4
50 & 52 guns	5	7	8	20	.	.	.	.	.	.	.	.	.	.	.	.	3	2	.	5	.	.	.	.
36 to 50 guns	6	7	5	18	20	.	1	21	.	2	.	2	.	.	.	.	3	1	.	4	5	6	3	14
Steam vessels	22	6	9	37	8	.	.	8	1	.	9	10	1	.	.	1	1		2	3	3	.	1	4
Grand Total .	48	38	60	146	72	3	8	83	9	16	35	60	17	2	1	20	21	9	3	33	8	13	9	30

America has contracted for a supply of timber to build 11 ships of the line.
The French steam vessels in the packet service are armed with heavy guns.

Ships of the Line.	Denmark. In Commis.	In Ordinary.	Building.	Total.	Sweden. In Commis.	In Ordinary.	Building.	Total.	Spain. In Commis.	In Ordinary.	Building.	Total.	Naples. In Commis.	In Ordinary.	Building.	Total.	Sardinia. In Commis.	In Ordinary.	Building.	Total.
100 guns and upwards .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
80 to 100 guns .	.	4	1	5	.	5	.	5	.	1	.	1	.	.	.	.	.	.	.	.
70 to 80 guns .	.	1	.	1	.	5	.	5	.	2	.	2	.	.	.	.	.	.	.	.
Of the Line .	.	5	1	6	.	10	.	10	.	3	.	3	.	.	.	.	.	.	.	.
Frigates. Razees & 60 guns	.	.	.	.	.	1	.	1	.	2	.	2	1	.	.	1	.	2	1	3
50 and 52 guns .	.	.	.	.	.	.	.	.	.	2	.	2	1	.	.	1	2	.	.	2
36 to 50 guns .	.	.	.	.	.	6	1	7	.	.	.	.	.	.	.	.	.	1	.	1
Steam-vessels .	.	.	.	.	.	2	.	2	.	.	.	.	1	.	.	1	2	.	.	2
Grand Total .	.	5	1	6	.	19	1	20	.	7	.	7	3	.	.	3	4	3	1	8

Holland has 104 gun-boats; Denmark, 67; Sweden, 337.

Until the Restoration there does not appear to have been any precise division into classes; nor have we any account of the armament of ships; at that time certain ships were ordered to be built to carry the following:—

Description of Guns.	1st Rate. 780 men.	2nd Rate. 660 men.	3rd Rate. 470 men.
Cannon = 42 pounders	26	..	..
Demicannon = 32 pounders	..	26	26
Culverins = 18 pounders	28	26	..
Demi do. = 12 pounders	..	..	26
Sakers = 6 pounders	28	26	..
Forecastle . .	4	..	4
Quarter-deck . .	12	10	10
3-pounders . .	2	2	4
Total number of guns	100	90	70

There was however no uniformity preserved; and in 1745 a committee was appointed, which recommended certain changes in the rating and arming, which however were not adhered to any more than the former systems. At the peace the Board of Admiralty represented this to the Prince Regent in a memorial. The present establishment of rates and classes was fixed by order in council, February, 1817:—

Class I.—Rated ships:

First-rate, comprising all three-decked ships.

Second. One of Her Majesty's yachts, and all two-decked ships whose war-complements consist of 700 men and upwards.

Third. Her Majesty's other yachts, and all ships whose complements are from 600 to 700.

Fourth. Ships whose complements are from 400 to 600.

Fifth. Ships whose complements are from 250 to 400.

Sixth. Ships under 250.

Class II. Sloops and bomb vessels.

All such vessels as are commanded by a commander.

Class III. All other smaller vessels, such as are commanded by lieutenants, or other inferior officers.

Table showing the armament of a ship of each class, and the weight of metal.

Number of Guns in each Ship.	Lower Deck. No.	Description & Weight.	Cwt.	Middle Deck. No.	Description & Weight.	Cwt.	Main Deck. No.	Description & Weight.	Cwt.	Upper Deck. No.	Description & Weight.	Cwt.
120-gun ship (old) .	4	8-inch	65	2	8-inch	65						
	20	32 pders.	56	32	32-pders.	50	34	32-pders.	42	6	32-pders	42
										14	32 p. carron des	17
110-gun ship (new) .	4	8-inch	65	4	8 inch	65				6	32 pders.	42
	24	32-pders.	56	26	32-pders	56	30	32 pders.	42	14	do	25
92 gun ship .	6	8 inch	65	..	.	.	4	8 inch	65			
	26	32-pders	56	..	.	.	30	32-pders	56	26	32-pders	42
84 gun ship .	6	8 inch	65	..	.	.	2	8 inch	65	6	32-pders	42
	4	32 pders	56	..	.	.	[illegible]	32-pders	48	10	32 p. car	17
80 guns .	8	8 inch	65	..	.	.	1	8-inch	6[illegible]			
	29	32 pders	56	..	.	.	24	32 pders.	5[illegible]	4	32 pders.	42
78 " .	4	8 inch	65	..	.	.	2	8 inch	65	6	32 pders	42
	26	32-pders	56	..	.	.	30	32 pders.	[illegible]	10	do. car.	17
72 " .	4	8 inch	65	..	.	.	..			4	32 pders.	42
	24	32 pders	56	..	.	.	28	32-pders	42	12	do car.	17
70 " .	4	8-inch	65	..	.	.	2	8 inch	65			
	22	32 pders.	56	..	.	.	26	32 pders.	50	16	32 pders.	42
Frigates. 50 guns, 1st class .	..	.	.	..	.	.	6	8-inch	65			
							2[illegible]	32 pders.	56	22	32 pders	42
50 guns, 2nd class .	..	.	.	..	.	.	4	8 inch	65	4	32-pders	42
							26	32 pders.	50	16	do.	25
44 guns .	..	.	.	..	.	.	2	8 inch	6[illegible]	4	32 pders.	[illegible]
							26	32-pders.	40	12	do. car.	17
42 guns .	..	.	.	..	.	.	2	8-inch	50	4	32-pders	39
							26	32-pders.	30	10	do. car.	17
39 guns .	..	.	.	..	.	.	2	8 inch	50	4	32 pders.	39
							24	32-pders.	39	8	do. car.	17
36 guns .	..	.	.	..	.	.	4	8 inch	60			
							18	32-pders.	56	14	32-pders.	41
26 guns .	..	.	.	..	.	.	2	8 inch	50	2	32-pders	40
							16	32 pders.	40	6	do.	25
24 guns, corvettes .	..	.	.	..	.	.	21	32-pders.	40			
26 guns, 2nd class .	..	.	.	..	.	.	2	8 in. cars	36			
							18	32-pders	25	6	32-pders.	25
26 guns, 3rd class .	..	.	.	..	.	.	2	32-pders.	25			
							18	32 p. car	17	6	18 pders	15
Sloops. 18 guns, corvette, 1st class	..	.	.	..	.	.	18	32-pders	40			
18 guns, ditto, 2nd class .	..	.	.	..	.	.	18	32 pders	2[illegible]			
18 guns, ditto, 3rd class .	..	.	.	..	.	.	2	32-pders.	25			
							16	do. car.	17			
16 guns, brigs .	..	.	.	..	.	.	2	32-pders.	32			
							14	do. car.	17			
10 guns, ditto .	..	.	.	..	.	.	2	18 pders.	20			
							8	18 car.	10			
Brigantines, 1st class .	..	.	.	..	.	.	1	32-pder.	40			
							2	do.	3[illegible]			
Brigantines, 2nd class .	..	.	.	..	.	.	1	32 pder	40			
							2	24 p. car.	13			

Great improvements have taken place in the size and form of the British ships, as well as in the arrangement of the materials composing them, especially during the present century. As France and Spain enlarged their ships, the English were obliged to do the same; while from many of their ships added to the English navy we greatly improved our models. The following view of the increase of the size of first-rates will demonstrate this point:—

Year.	Tonnage of First-Rates.
1677	1500 to 1600
1720	1800
1745	2000
1795	2350, the Ville de Paris.
1808	2616, Caledonia.
1839	3100, Victoria, and 3 others building.

There is now a frigate of greater tonnage than the first-rate of 1745, viz. the Vernon, of 2080 tons, and 50 guns.

We cannot do more than glance at the improvements in naval architecture. Sir Robert Seppings, late surveyor of the navy, introduced the circular bow and stern, the system of diagonal timbering or bracing, whereby the strength and durability of our ships are so immensely increased; the method of scarfing short pieces, by which the delay and difficulty often attendant on the procuring of crooked timber are avoided; the making frigate-timber applicable to the building of line-of battle ships, by the use of a circular coak, or dowel, instead of chocks, thereby effecting a saving of about 1000*l.* in the building of a 74-gun ship, and the use of iron knees, by which he effected an immense saving of timber and space.

Sir William Symonds, now surveyor of the navy, has effected a still further economy of space by removing the chocks behind the iron knees, and using metal diagonal braces instead of wood. In latter years the various naval architects, Sir R. Seppings, Captains Hayes and Symonds, R.N., and Professor Inman, have been permitted to try their respective systems in various experimental squadrons, composed of vessels built under their directions; and although many opinions are held as to the merits of each, there can be but one with regard to the general advantage arising to the science of naval architecture, so long neglected. A school for shipwright apprentices was established at Portsmouth, which, after producing more officers than could be provided for, was broken up. Our ships, those at least built of oak—for we have not yet worn out a ship built of teak—do not seem to be as durable as in former times. The Royal William, of 100 guns, which bore the flag of Sir Richard Bickerton at Spithead in 1813, and was shortly after broken up, was built in the year 1719. The Sovereign of the Seas, built in 1637, was repaired in 1684, when all the antient timber was so hard that it was difficult to work it. It was the practice in the north of England, and in Staffordshire especially, to bark timber standing, and to let it remain in that state for a time to season. The Sovereign of the Seas was built of such timber. The Achilles, 60, was built by contract in 1757, of timber barked in the spring and felled in the next winter: she was docked in 1770, and found exceedingly sound, and was sold 1784, because she was too small for the line-of-battle. The Hawke sloop was built in 1793. Half of this vessel was built of timber barked in 1787, and felled in 1790; the other half of timber felled in the usual manner from the same soil and neighbourhood. In 1803 she was so decayed that she was taken to pieces; both sides appear to have been equally decayed.

The government of the navy is vested in the lord-high-admiral, which office has been in commission since the Revolution, with the exception of two short periods, 1707-8 and 1827-8, when it was held respectively by Prince George of Denmark and his late majesty when duke of Clarence. At present the Board consists of a First Lord, who is a member of the cabinet, and five junior lords. By their orders all ships are built, sold, or broken up; commissioned, employed, and paid off. All appointments and promotions are made or approved by them; all honours, pensions, and gratuities are granted on their recommendation. All orders for the payment of naval monies are made by them; they prepare the navy estimates, and lay them before parliament. The civil departments of the admiralty are directed by the surveyor of the navy, accountant-general, storekeeper-general, comptroller of victualling, and physician-general.

The navy is composed of two bodies of men—seamen and marines.

There are commissioned, warrant, and petty officers.

The commissioned officers are flag-officers, captains, commanders, and lieutenants.

Flag-officers are divided into the following classes, and rank and command in the order here following:—

Admirals of the fleet.

Admirals of the red, white, blue squadrons.

Vice-admirals of the red, white, blue squadrons.

Rear-admirals of the red, white, blue squadrons.

There are superannuated and retired rear-admirals, who enjoy the rank and pay, but do not rise.

The admiral of the fleet, when in command, bears the union flag at the main-top-gallant-mast. The other flag-officers bear a square flag of the colour of their squadron at the main, fore, or mizen top-gallant-mast, according to their rank.

The flag-officer holding the chief command of a fleet or squadron employed within certain geographical limits, termed a station, is called a commander-in-chief. He is responsible for the efficiency and conduct of the fleet under his orders; he disposes of the vessels composing it in such manner as will be most advantageous for the service; but without some especial necessity he is never to send one beyond the limits of his station. All vacancies in ships under his orders which are caused by death or dismissal from the service by the sentence of a court-martial, are in his gift.

A temporary rank is given to captains called commodore; they are of two classes; the first class having the pay and allowance of a rear-admiral, with a captain under him; they bear a broad pendant, but must strike it in the presence of a senior captain. Captains and commanders are appointed to command her majesty's ships, except when the latter are appointed to flag-ships and ships of the line, under a regulation of his late majesty when lord-high-admiral; in which case they must have served three years in command of a sloop or as first-lieutenant of a rated ship.

When a captain or commander is ordered to commission a ship, he does so by hoisting a long pendant, having a St. George's cross on a white field next the mast, and a fly of the colour of the Admiral's flag under whose orders he is placed. No vessels, except such as belong to her majesty, or are hired for her service, and commanded by a naval officer, are entitled to wear this pendant. The ship being commissioned, a hulk, or receiving ship, is allotted for the use of the crew while fitting for sea; a party of marines, commanded in rated ships by a commissioned officer, is sent on board; seamen are entered as they volunteer, on being reported fit for the service after examination by the surgeon; stores are demanded as required, and the sea-stores, provisions, and water stowed away. When ready for sea, the ordnance and powder are received on board; the crew are paid two months' wages in advance, and the ship only waits the sailing orders from the admiralty to proceed to her destination. The duty of the captain as regards the books and accounts is regulated by act of parliament; but the interior arrangements and discipline depend mainly on himself, in which he has for his guidance the act 22 Geo. II., called the Articles of War, and the General Printed Instructions issued by the Admiralty. All muster and pay books, &c. are signed by the captain, commander, or senior lieutenant, master, and purser, or other officer in whose charge the stores in question may be placed. A commander must have been employed on actual service and full pay for one complete year to become eligible for promotion to the rank of captain.

The senior lieutenant is nominated by the captain, and has under his direction the whole management and superintendence of the internal arrangements of the ship; indeed on the qualifications of this officer must in a great measure depend the state of discipline and efficiency. The other lieutenants take the watch by turns, during which time they have charge and command of the ship; they are never to quit the deck without being relieved. The watches are periods of four hours, except that from four to eight P.M., which is divided into two, called the dog-watches. No mate is eligible for the rank of lieutenant until he has served six complete years in the navy, has completed his nineteenth year, and passed in seamanship and navigation.

A lieutenant must have served two complete years at sea to qualify him for promotion to the rank of commander. The warrant and petty officers take rank and command in the order in which they stand in the table of pay, with the exceptions here following:—

Masters, Secretaries, Physicians, Chaplains, Surgeons, Pursers,	Rank with, but subordinate to Lieutenants.	Mates, Second Masters, Assistant Surgeons, Gunners, Boatswains, Carpenters,

of whom, masters, mates, second-masters, gunners, boatswains, carpenters, and take military command.

The master has charge and stowage of the holds; a general charge of stores and store-rooms, over the gunner, boatswain, and carpenter; and navigates the ship under the directions of the captain. Secretaries are appointed by the flag-officer whom they serve.

Chaplains must be in priest's orders of the Church of England.

The purser has charge of the provisions, and the issuing of them, also of the slop clothing, soap, and tobacco; he enters into a penal bond with sureties for the honest discharge of his duties.

Mates are midshipmen who, having passed the examination qualifying them for the rank of lieutenant, receive a warrant from the captain; their rank and command cease on their discharge or the ship being paid off.

Gunners, boatswains, and carpenters must have served a complete year as petty officers before they can be promoted. The gunner has charge of all ordnance stores; the boatswain, of all the sails, rope, and rigging; the carpenter, of of all stores in his department, and is also to see the ports secure and water-tight, and to sound the well daily, and have the pumps in order for service.

In the event of the command of a ship devolving on petty officers, they are to take rank and command as they stand in the table of pay, except the following, who are not to take command:—

Schoolmasters, Masters-at-arms,
Clerks, Ship's corporals.

Midshipmen are rated by the captain, being fourteen years of age, and having served two years as volunteer of the first-class, or three in any other capacity; they are appointed by the captain, subject to the approval of the Admiralty, only one fresh entry into the service being allowed in each ship. They have no specific duties.

Schoolmasters must pass an examination to qualify them for that situation.

Cooks, Ropemaker,
Masters-at-arms, Caulkers,
Sailmakers, Coopers,

are appointed by warrant from the Admiralty or commander-in-chief.

The crew of a ship consists of petty officers, able seamen, ordinary seamen, landsmen, boys, and marines. In time of peace the whole crew are entered voluntarily; during war, the very superior rate of wages which the merchants are compelled to give, renders the press inevitable. The following persons are exempt from it, and no seaman can be impressed except by an officer having a press-warrant:—

Masters of merchant vessels;

Mates of those above 50 tons;

Boatswains and carpenters of vessels of 100 tons and upwards;

Men belonging to craft of all kinds employed in the navy, victualling, ordnance, excise, customs, and post-office;

Watermen belonging to the insurance offices in London and Westminster;

All men above 55 or under 18 years of age;

Apprentices not having used the sea before the date of their indentures, and not more than three years from the said date;

Landsmen not having served at sea full two years;

Harpooners, line-manngers, steerers, and all seamen and mariners who have entered the Greenland and southern whale-fisheries.

The best seamen are rated petty officers by the captain; they are of two classes, distinguished by a crown and anchor for the first class, and an anchor for the second, worked in white cloth upon the left arm; they have an increase of pay, and are not amenable to corporal punishment while holding that rank.

There is a supply of boys to the navy from the asylum at Greenwich and from the Marine Society, but many more are brought into the navy by volunteering. Every ship, according to her rate or class, bears a certain number of marines, as part of her complement. [MARINE.]

For the due maintenance of that discipline without which the navy would be powerless, the captain or commander of every ship or vessel is authorised to inflict corporal punishment on any seaman, marine, or boy, by warrant under his hand. Courts-martial are ordered by the Admiralty and commanders-in-chief.

P. C., No. 992.

The following abstract shows the daily allowance of provisions to every person in the fleet:—

Fresh meat, 1 lb. Soft bread, 1½ lb.
Vegetables, ½ lb. Beer, 1 gallon.

When the above are not issued, the following:—

Salt beef, ¾ lb. and Flour, ¾ lb. } alternately { Salt pork, ¾ lb. and Pease, ½ pint.
Biscuit, 1 lb.
Spirits, ½ pint, or wine, 1 pint; and, whether on fresh or salt provisions,
Cocoa, 1 oz.
Tea, ¼ oz.
Sugar, 1½ oz.
Vinegar, ½ pint } weekly.
Oatmeal, ½ pint } weekly.

A portion of the flour may be exchanged for a proportion of suet and raisins; and after 14 days on salt provisions, lemon-juice is allowed in addition.

The following tables will show the full-pay of every officer and seaman in each class of her Majesty's ships, and the half-pay of all officers entitled to the same:—

	Full-Pay. £.	s.	d.	Half Pay. £.	s.	d.
Admiral of the fleet . .	6	0	0	3	3	0
Admiral	5	0	0	2	2	0
Vice-admiral . . .	4	0	0	1	12	6
Rear-admiral . . .	3	0	0	1	5	0
Commodore of first class and captain of the fleet . .	3	0	0	of their rank.		
Master of the fleet . .	0	10	11	0	0	0
Physician of less than three years	1	1	0	0	10	6
Physician of less than ten years	1	11	6	0	15	0
Physician of more than ten years	2	2	0	1	1	0
Secretary to admiral of fleet.	1	7	4	0	0	0
Secretary to admiral commander-in-chief . .	1	1	11	0	0	0
Secretary to vice or rear admiral commander-in-chief.	0	16	5	0	0	0
Secretary to a junior flag-officer or commodore .	0	8	2	0	0	0

	Full Pay. s.	d.	
Two clerks to secretaries of commanders-in-chief, each. . .	3	4	per diem.
One clerk to junior flag-officers .	2	9	"
Admiral's coxswain . . .	1	9	"
Admiral's steward, Admiral's cook, Admiral's domestics* . . .	1	2	"

*The number of these ratings are, for the

Admiral of the fleet . . .	12
Admiral	10
Vice-admiral	7
Rear-admiral or commodore of 1st class	5
Captain of the fleet . . .	3

In flag-ships all the lieutenants (including one extra as flag-lieutenant) are allowed 6*d.* per diem additional pay. Surgeons are paid according to their length of service.

	Per Diem £.	s.	d.
Of less than six years' service . .	0	10	0
Of more than six and less than ten .	0	11	0
Of more than ten and less than twenty .	0	11	0
Of more than twenty	0	18	0
Surgeons of hospital-ships . . .	0	18	0

Half-Pay.

	Per Diem. s.	d.
Captains.		
To each of the first 100 on the list in seniority	14	6
To the next 150	12	6
To the remainder	10	6
Commanders.		
To the first 150	10	0
To the rest	8	6
Lieutenants.		
To the first 300	7	0
To the next 700	6	0
To the remainder	5	0

Royal Marines. [MARINE.]

	Per Diem. s.	d.
Masters.		
To each of the first 100	7	0
To the next 200	6	0
To the remainder, having served 5 years in the navy	5	0
Surgeons.		
Of six years' service	6	0
Under that time	5	0
Assistant-Surgeons.		
Three years' service	3	0
Two years'	2	0
Dispensers	5	0
Chaplains.		
After eight years at sea or ten in harbour	5	0
For each year's subsequent service, 6*d.* per diem till it reach	10	0
Pursers.		
To the first 100	6	0
To the next 200	5	0
To the remainder	4	0
Naval Instructors and Schoolmasters.		
Two years' service	2	0
Three years' do.	3	0

The following table shows the number of officers for active service at three periods since the peace:—

Rank.	1816.	1830.	1839.
Admirals	65	41	38
Vice-admirals	68	62	53
Rear-admirals	76	65	64
Captains	848	853	687
Commanders	809	902	809
Lieutenants	3886	3564	2822
Masters	694	523	456
Surgeons	951	731	601
Assistant-Surgeons	462	358	360
Pursers	957	644	560
Chaplains	62	64	29

There are 19 naval instructors and schoolmasters appointed under regulations issued May 1st, 1837, who receive 6*l.* 14*s.* per lunar month, and 30*l.* per annum bounty, and 5*l.* a-year from each young gentleman who shall receive instruction from him. An additional rating of first-class petty-officers is also allowed, called 'seamen's schoolmaster

There are at present 56 retired rear-admirals and 8 retired captains; 100 retired commanders under order in council of 30th January, 1816, and 181 under order in council November 1st, 1830. There are 7 naval Knights of Windsor, 9 superannuated masters, 11 physicians, 81 retired surgeons, 40 retired chaplains, and, in the above table, there are 138 surgeons and 27 masters unfit for *active* service: of the lieutenants, probably not many more than 1000 are fit for active service.

Net Sea Pay of the Royal Navy.

Ranks and Ratings.	First Rate Pay per Mensem.	Second Rate. Pay per Mensem.	Third Rate. Pay per Mensem	Fourth Rate. Pay per Mensem.	Fifth Rate. Pay per Mensem.	Sixth Rate. Pay per Mensem.	Sloops. 100 Men and upwards. Pay per Mensem.	Sloops. Under 100 Men. Pay per Mensem.	Bombs. Pay per Mensem.	Gun brigs, Schooners, Cutters. Pay per Mensem.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Captain	61 7 4	53 14 0	46 0 8	38 7 0	30 13 8	26 17 0				
Commander	23 0 4	23 0 4	23 0 4	. .	. .	. .	23 0 4	23 0 4	23 0 4	
First Lieutenant, of 7 years' standing	11 10 0	11 10 0	11 10 0							
All other Lieutenants	9 4 0	9 4 0	9 4 0	9 4 0	9 4 0	9 4 0	9 4 0	9 4 0	9 4 0	11 10 0
Master	13 0 8	12 5 4	11 10 0	10 14 8	9 4 0	8 8 8	7 13 4	7 13 4	7 13 4	7 13 4
Chaplain	12 5 4	12 5 4	12 5 4	12 5 4	12 5 4					
Surgeon	see ante									
Purser	7 0 0	in all								
Naval Instructor	see ante									
Mates	3 18 8	in all								
Second Master	5 9 4	do.								
Assistant-Surgeon	9 4 0									
Gunner, Boatswain, Carpenter	7 0 0	7 0 0	7 0 0	5 9 4	5 9 4	5 9 4	4 14 0	4 14 0	4 14 0	
Engineers	see note									
Midshipman	2 8 0	in all								
Master's Assistant	3 11 0	do.								
Volunteer, 1st class	1 2 0	do.								
Clerk	4 14 0	4 6 4	4 6 4	3 18 8	3 11 0	3 11 0	3 11 0	3 11 0	3 11 0	3 11 0
1st Class Petty Officers. Master at-arms	2 12 0	2 12 0	2 12 0	2 9 0	2 9 0	2 9 0	2 7 0	2 7 0	2 7 0	2 7 0
Seamen's Schoolmaster	2 12 0	2 10 0	2 8 0	2 6 0	2 4 0	2 2 0	2 1 0	2 1 0	2 1 0	2 1 0
Captain's Coxswain, Gunner's Mate, Boatswain's Mate, Quartermaster	2 6 0	2 6 0	2 6 0	2 4 0	2 4 0	2 4 0	2 2 0	2 2 0	2 2 0	2 2 0
Captain of Forecastle, Ship's Corporal, Coxswain of Launch, Captain of Hold	2 6 0	2 6 0	2 6 0	2 4 0	2 4 0	2 4 0	2 2 0	2 2 0	2 2 0	2 2 0
Sailmaker, Carpenter's Mate, Caulker, Ropemaker, Blacksmith	2 12 0	2 12 0	2 12 0	2 9 0	2 9 0	2 9 0	2 7 0	2 7 0	2 7 0	2 7 0
Ship's Cook	2 13 6	2 13 6	2 13 6	2 13 6	2 13 6	2 12 6	2 12 6	2 12 6	2 12 6	2 12 6
2nd Class Petty Officers. Captain of Main-top, Captain of Fore-top, Captain of Mast, Captain of Afterguard, Yeoman of Signals, Coxswain of Pinnace	2 1 0	2 1 0	2 1 0	2 0 0	2 0 0	2 0 0	1 18 0	1 18 0	1 18 0	1 18 0
Sailmaker's Mate, Cooper, Armourer, Caulker's Mate	2 6 0	2 6 0	2 6 0	2 3 0	2 3 0	2 3 0	2 0 0	2 0 0	2 0 0	2 0 0

Net Sea Pay of the Royal Navy—continued.

	Pay Per Mensem. £ s. d.
Captain of Mizen-top	1 16 0 in all rates.
Carpenter's Crew	
Sailmaker's Crew	
Cooper's Crew	
Purser's Steward	
Painter	
Able Seaman	
Yeoman of Storeroom	
Sick-berth Attendant	
Trumpeter	
Captain's Steward	1 14 0 do
Captain's Cook	
Ward-room or Gun-room Steward and Cook	
Midshipmen's Steward and Cook	

	Pay Per Mensem. £ s. d.
Ordinary Seaman	1 6 0 in all rates.
Purser's Steward's Mate	1 3 0 do.
Cook's Mate / Barber	1 6 0 do.
Landsman	1 3 0 do.
Seamen Gunners	0 2 0 do. 0 4 0 do. after 5 years' service. 0 5 0 do. after 10 years' service, in addition to the pay of any other rating they may hold.
Boys.—1st class	0 14 3 in all rates.
2nd class	0 12 9 do.
Engineer boys	see note.

	£.	s.	
Engineers of the 1st class	12	0	per lunar month, and 6*d.* a-day for each boy they instruct.
" 2nd class	8	0	per lunar month.
" 3rd class	5	6	per lunar month; and within the tropics, while the steam is up, one-half in addition to the above.

	£.	s.	d.	
Engineer boys, 1st class	1	14	0	per lunar month.
" 2nd class	1	6	0	"
" 3rd class	1	3	0	"
" 4th class	0	14	6	"

The carpenter and each of his crew are allowed seven shillings per month additional for tools.

Where no surgeon is borne, the assistant-surgeon receives an increase of pay of 1*s.* 6*d.* per diem.

Having shown the emoluments of those who are fit for active employment in her Majesty's naval service, we will now turn to the rewards and pensions for services rendered and wounds or other injuries received; and in the first place we must name that noble establishment and asylum for worn-out seamen, Greenwich Hospital. The idea of establishing an hospital for infirm and disabled seamen originated with Mary, consort of William III., and Sir Christopher Wren was employed to build an additional wing to Greenwich Palace. The king granted 2000*l.* a-year towards it, large subscriptions were added by noble and wealthy persons, estates were willed to it by individuals, all mariners were made to subscribe 6*d.* per month, forfeited and unclaimed prize-money and various grants were given. The forfeited estates of the earl of Derwentwater, the net rental of which is now between 30,000*l.* and 40,000*l.* a-year, were given. The revenue of the hospital is about 150,000*l.* a-year. The establishment consists of a governor, lieutenant-governor (both flag-officers), four captains, and eight lieutenants, residing in the hospital. There are about 2710 in-pensioners, and 120 matrons and nurses, all of whom must be seamen's widows.

The following is the scale of pensions for officers and seamen wounded and worn-out in the service:—

	Per Annum. £.	s.		Per Annum. £.	s.
For an admiral, from	300	0	to	700	0
" captain (wounds),	250	0	Loss of limb	300	0
" commander "	150	0	"	200	0
" lieutenant "	91	5	"	91	5

Marine officers, as in the army.

Every mate, second master, assistant-surgeon, midshipman, master's assistant, naval instructor, clerk, and volunteer of the first and second class, from 1*s.* to 2*s.* 6*d.* a day, according to the nature and degree of the injury.

Boatswains, gunners, carpenters, and engineers, when unfit for further service, shall receive a superannuation allowance of 3*l.* a year for each year they served in a ship in commission, and 1*l.* a year each year in ordinary, and a further sum of from 1*l.* to 15*l.* a-year may be added by the Admiralty. They retain besides any pension for servitude as a petty-officer to which they may be entitled, and for wounds from 15*l.* to 50*l.* a year in addition to all other pensions.

Every other petty officer, seaman, marine, and boy, shall receive for wounds from 6*d.* to 2*s.* a day; and every able seaman for twenty-one years' servitude, reckoning from the age of twenty, from 10*d.* to 1*s.* 2*d.* a day; if discharged from infirmity after fourteen years' service, from 6*d.* to 9*d.* a day; and under fourteen years' service, if discharged from disability contracted in the service, from 3*d.* to 6*d.* a day, or a gratuity in lieu, of 1*l.* to 18*l.* If a man become totally blind, he shall have 3*d.* a day added to any of the above. Ordinary seamen receive three-fourths, landsmen two-thirds, boys half the able seaman's pension. Marines, as able seamen.

The following petty and non-commissioned officers shall receive, in addition to the above, the following allowances:—

Superior Petty.	£	s.	d.	Yrs. of Service.	£	s.	d.	Inferior Petty.
	0	15	2½	1	0	7	7¼	
	1	10	5	2	0	15	2½	
	2	5	7½	3	1	2	9¾	
Master-at-arms	3	0	10	4	1	10	5	
Admiral's cox-	3	16	0½	5	1	18	0¼	
swain	4	11	3	6	2	5	7½	
Ship's corporal	5	6	5½	7	2	13	2¾	Captain of main-
Captain's cox-	6	1	8	8	3	0	10	top
swain	6	16	10½	9	3	8	5¼	Captain of fore-
Quartermaster	7	12	1	10	3	16	0½	top
Gunner's mate	8	7	3½	11	4	3	7¾	Captain of mast
Boatswain's mate	9	2	6	12	4	11	3	Captain of after-
Captain of fore-	9	17	8½	13	4	18	10¼	guard
castle	10	12	11	14	5	6	5½	Yeoman of sig-
Captain of hold	11	8	1½	15	5	14	0¾	nals
Coxswain of	12	3	4	16	6	1	8	Coxswain of pin-
launch	12	18	6½	17	6	9	3¼	nace
Ship's cook	13	13	9	18	6	16	10¾	Sailmaker's mate
Sailmaker	14	8	11½	19	7	4	5¾	Caulker's mate
Ropemaker	15	4	2	20	7	12	1	Armourer's mate
Carpenter's mate	15	19	4½	21	7	19	8¼	Cooper
Caulker	16	14	7	22	8	7	3½	Corporal of ma-
Armourer	17	9	9½	23	8	14	10¾	rines
Serjeant of ma-	18	5	0	24	9	2	6	
rines	19	0	2½	25	9	10	1¼	
	19	15	5	26	9	17	8½	
	20	10	7½	27	10	5	3¾	
	21	5	10	28	10	12	11	
	22	1	0½	29	11	0	6¼	
	22	16	3	30	11	8	1½	

Persons discharged with disgrace, or by sentence of a court-martial, are not entitled to a pension. On a ship being paid-off, the captain may recommend any petty-officer or seaman, non-commissioned officer or marine, for the medal and gratuity for invariable good conduct; 15*l.* for first-class petty-officers and serjeants, if they have served as such ten years, 7*l.* to second-class petty-officers and serjeants who have served as such seven years, and 5*l.* to able seamen and marines.

The widows of officers who are left in distressed circumstances receive pensions on the following scale, under the regulations and at the discretion of the Board of Admiralty.

		Per Annum.
The widow of a	Flag-officer	120*l.*
	Retired rear-admiral	100
	Captain, three years' standing	90
	„ under three years,	80
	Commander	70
	Superannuated commander	60
	Physician	60
	Lieutenant	50
	Master	40
	Chaplain	40
	Surgeon	40
	Purser	40
	Assistant-surgeon	36

The amount paid in pensions to officers for wounds and good service, to widows of officers, widows and relatives of officers slain, and the out-pensioners of Greenwich Hospital, is 521,572*l.*

Abstract of Pensions paid to the Navy.

	£.
Good-service pensions	4,350
Commissioned and warrant officers	81,619
Widows and relatives of officers slain	11,786
Widows of naval officers	172,381
Widows of marine do.	10,356
Compassionate fund	14,000
Out-pensions of Greenwich Hospital	227,000
	521,572

There are two schools at Greenwich, called the Upper and Lower Schools.

The Upper School comprises two classes:

1st. One hundred sons of commissioned and ward-room warrant-officers of the Royal Navy and marines.

2nd. Three hundred sons of officers of the above or inferior rank, of private seamen and marines who have served or are serving her Majesty, and of officers and seamen of the merchant service.

They are admitted from eleven to twelve years of age, under certain regulations, and are subject to the same discipline, diet, education, clothing, and destination. The term of education is three years, at the expiration of which, or sooner if the course of education be completed, they are sent to sea in the queen's or merchant service, or otherwise disposed of, as may be determined on.

The Lower School consists of 400 boys and 200 girls, the children of warrant and petty officers, seamen and non-commissioned officers and privates of marines, who have served or are serving, or have lost their lives in the service of her Majesty. They are admitted from nine to twelve years of age, and quit at fourteen, the boys being sent to sea, and the girls put to trades and household service; any unprovided for at fourteen are sent to their parents. Any boy may be removed from this to the Upper School on obtaining a presentation, if not more than twelve years old, and possessing character and abilities.

We have seen that in 1744 all prizes were declared to be the property of the captors; the following is the scale of the distribution of prize-money by order in council, February 3, 1836:—the flag-officer or officers have one-sixteenth part of the proceeds; the captain or captains one-eighth part of the remainder, or, where there is no flag-officer, one-eighth part of the whole; the remainder shall be distributed in shares, according to the following scale:—

First class. The sea-lieutenants, captains of marines, master and physician of the fleet, and masters, ten shares each.

Second class. Lieutenants of marines, secretaries, chaplains, surgeons, pursers, mates, second-masters, gunners, boatswains, carpenters, and first engineers, six shares each.

Third class. Assistant-surgeons, midshipmen, masters'-assistants, schoolmasters, junior engineers, clerks, masters-at-arms, admirals' and captains' coxswains, quartermasters, gunners' and boatswains' mates, captains of the forecastle and hold, coxswain of the launch, sailmakers, ropemakers, carpenters' mates, caulkers, armourers, captains of the fore and main top, pilots and serjeants of marines, three shares each.

Fourth class. Volunteers of first class, ships' cooks and corporals, captains of the mast and afterguard, yeomen of signals and coxswain of the pinnace, sailmakers' mates, coopers', caulkers', and armourers' mates, and corporal of marines, two shares each.

Fifth class. Gunner's crew, seamen-gunners, carpenters', sailmakers', and coopers' crews, able and ordinary seamen, yeomen of store-room, stokers, privates and fifers of marines of seven years' service, one share each.

Sixth class. All other ratings, boys of the first class, and marines under seven years' service, two-thirds of a share each.

Seventh class. Volunteers of 2nd class and boys of 2nd class, one-third of a share each.

When captains and commanders share together, the captain to have double the commander. Lieutenants in command share as captains when not in company with a captain or commander. Clerks in charge, as pursers if no purser be present.

When any of her Majesty's ships carries bullion or jewels on freight, the captain or commander is allowed a per centage, regulated by the queen in council, as compensation for the risk and charge, one-fourth part of which is given to Greenwich Hospital, one-fourth part to the commander-in-chief if he shares the responsibility, and the other half to the captain.

Officers settling in the Australian colonies are allowed a remission of the purchase-money, in amount from 100*l.* to 300*l.*, according to their rank and length of service.

(Reference has been made to Derrick's *Memoirs of the Rise and Progress of the Royal Navy;* James's *Naval History;* Sir W. Raleigh's *Essay on the Invention of Shipping;* Sharon Turner's *Hist. Anglo-Saxons;* Barrow's *Life of Lord Anson;* and various official papers.)

NA'XIA. [Maiadæ, vol. xiv., p. 298.] Dr. Leach appears to have been the first who established the genus.

NAXOS, NAXIA, one of the larger Cyclades, between 36° 45′ and 37° 15′ N. lat. and 25° 20′ and 25° 35′ E. long., lies east of Paros, from which it is separated by a channel six miles wide. It is situated in the middle of the Archipelago, about half way between the coast of Greece and that of Asia Minor. It was antiently called Strongyle (round) on account of its shape, and also Dia, in honour of Jupiter, and Dionysias, from the worship of Dionysus, who, according to the mythi, was brought up on this island. Its first inhabitants were said to have been Thracians. The name of Naxos has been stated by some to have been derived (Stephanus of Byzantium: Νάξος) from that of the leader of a Carian colony which settled on the island. According to Herodotus the Greek inhabitants of Naxos were Ionians from Athens (viii. 46). The island was taken by the Athenians in the time of Pisistratus. The Persians made a fruitless attempt to take the island, under the conduct of Aristagoras, but it afterwards was captured and ravaged by them under Datis and Artaphernes (B.C. 490). After the defeat of Xerxes at Salamis (B.C. 480), the Naxians threw off the Persian yoke and recovered their independence. After the battle of Mycale, Naxos became one of the confederate states, at the head of which was Athens; and it was the first of those states that fell under political subjection to Athens.

In modern times, Naxos, after the conquest of Constantinople by the Latins, became the seat of a dukedom founded by the Venetians, which embraced most of the other Cyclades. [Archipelago, Grecian.] It was taken possession of by the Turks in the sixteenth century, and it now forms part of the new kingdom of Greece.

Naxos is the most fertile of the Cyclades, and its wine is much esteemed; it produces corn, oil, cotton, silk, most kinds of fruit, and abounds with game. The plains and valleys are well supplied with springs, and all travellers describe Naxos as a very pleasant country. The chief town, called Naxia, is on the western coast of the island, and near it is the harbour, called Porto Saline, on account of the sea-salt which is collected there. The castle of Naxia, on the hill above the town, was built by the Venetians, and was the residence of the dukes. According to Thevenot, the plant which produces the ladanum grows here, and in his time the substance was collected from the beards of the goats which fed on the plant, in the manner mentioned by Herodotus (iii. 112). There are about forty villages and many country-houses scattered about the island, the population of which is reckoned at 10,000. There is a Greek and a Latin bishop, with convents of both churches. The northern part of the island contains some mountains, from which came a kind of marble called by the Greeks ophites on account of its being spotted like a serpent's skin, and which was much valued. Emery is also found there, which is considered of the best kind, and

constitutes an article of export. According to the description of Thevenot, what he calls the palace of Bacchus, that is the temple of Bacchus, must have been in tolerably good preservation in his time: but the Turks and others were then constantly employing the materials for various purposes. Tournefort, who travelled forty years later, describes the gate of the temple as the only part left standing, and gives a sketch of it; it was of white marble, of elegant though simple workmanship, 18 feet high and 11 wide; it stood on a detached rock near the coast of the harbour. There was an antient city of Sicily called Naxos, north of Catane and near the site of Taormina, which was founded by some Chalcidians from Eubœa. (Strabo, p. 267.)



Coin of Naxos.
British Museum. Actual Size. Silver.

NAZARENES. It appears from many parts of the New Testament, that the majority of the Jewish converts to Christianity continued to observe the precepts and ceremonies of the Mosaic law. The destruction of Jerusalem by Titus was the cause of many of the Jewish Christians laying aside their peculiar customs; and from this time those Christians who continued to preserve the Mosaic law appear to have received the name of Nazarenes and Ebionites. These two sects, though frequently confounded, differed in many essential particulars; the latter held many erroneous opinions on some of the leading doctrines of the Christian faith, while the former only differed from the orthodox in maintaining that Jewish Christians were bound to observe the Mosaic law as well as the precepts and commandments of the Christian religion. The early fathers do not appear to have regarded the Nazarenes as heretics. This may be the reason why we find no mention of them till the fourth century, when they are named, for the first time, by Epiphanius. On the gospel of the Nazarenes, see GOSPEL.

(Burton's *Lectures on the Ecclesiastical History of the Second and Third Centuries*, p. 89, 90; Mosheim's *Ecclesiastical History*, vol. i., p. 191, 192, ed. of 1826; Lardner's *Works*, vol. vi., p. 383-387; vol. x., p. 104, ed. of 1831; and the article EBIONITES in this work.)

NAZARETH. [SYRIA.]

NEAGH, LOUGH, a lake in the province of Ulster, in Ireland. Its form approaches to that of a parallelogram, having its length from north to south, from the village of Toome to the place where the Blackwater river enters the lake, about 18 miles; and its breadth from east to west, about 11 or 12 miles. It is bounded on the north and east sides by the county of Antrim; on the south-east, for a very short distance, by that of Down; on the south side by that of Armagh; and on the west side by that of Tyrone. The area occupied by Lough Neagh is estimated at more than 98,000 English acres, or 154 square miles; and its circumference, following the windings of the shore, at about 80 miles. The surface of the lake is 48 feet above the level of the sea at low-water, and its greatest depth is about 102 feet. It is the largest lake in the British Islands.

The border of Lough Neagh forms by its windings several small bays; such as Antrim bay, which forms the north-eastern angle, Sandy bay and Bartin's bay, on the east side, and Washing bay, in the south-western angle. The points of land projecting into it are Ardmore and Lignabey points on the east side, Mulloch point on the west side, and Rauskin point in Washing bay. There are several islands, but they are very small; on Ram Island, one of them, there is an antient round tower. Lough Neagh receives a number of streams: the Blackwater enters it at the south-western angle, in Washing bay; the Upper Bann, which is incorporated with the line of the Newry canal, on the south side; the Six-mile-water at the north-eastern angle, near Antrim; the river Main on the north side; and the river Moyowla or Moyola in the north-western angle. The only outlet is the Lower Bann, which quits the lake at the north-western angle, near where the Moyowla enters it, and, passing through Lough Beg, enters the ocean below Coleraine.

The shores of Lough Neagh are low and flat, and in some parts marshy and liable to be frequently flooded; they are altogether deficient in picturesque beauty. The water of the lake possesses in several parts a petrifying quality, which it is supposed to derive from the adjacent shore. The petrified wood is manufactured into approved hones, and the pebbles found in the white sand of the shores, chiefly chalcedony, are polished and employed for seals and necklaces. The char, the pullan, or fresh-water herring, the dollaghern (a species of trout), and other fish, are taken in its waters; and the swan, the heron, the bittern, the teal, and the widgeon frequent the shores.

Lough Neagh is navigated by small vessels, and communicates by one canal with Lisburn, Belfast, and by another with Newry. A steam-boat is employed on it in towing vessels across.

NEAL, DANIEL, an English dissenting divine and writer of considerable eminence, was born in London on the 14th of December, 1678. His early education was received at Merchant Taylors' school. In 1697 he entered the academy of the Rev. Thomas Rowe; and after having continued there about three years, went to prosecute his studies at Utrecht and Leyden. On returning to England he became assistant to Dr. Singleton, the pastor of an independent congregation in Aldersgate Street; and at the death of the latter in 1706, was chosen his successor. Notwithstanding his official duties, in discharging which he was eminently faithful, he found leisure for literary labours. In 1720 he published a 'History of New England,' and subsequently edited a 'Narrative of the Method of Inoculating for Small-pox,' practised in the same state. His printed discourses also are numerous. But his chief work is the 'History of the Puritans,' which is written with great minuteness and accuracy. It was originally published in 4 vols. 8vo., the first of which appeared in 1732, and the second, third, and fourth in 1733, 1736, and 1738 respectively. It has since passed through many editions. The first volume was reviewed by Dr. Maddox, bishop of St. Asaph, and the remaining volumes by Dr. Zachary Grey. To the former Neal himself replied; and an answer was given to the latter by Dr. Toulmin, in an edition of Neal's History, published in 1797. Neal died in Bath, in April, 1743, highly esteemed as an author and a divine. (*Neal's Life*, by Toulmin.)

NEANDER, CHRISTOPHER FREDERIC, deservedly esteemed as the author of some of the best specimens of devotional poetry in the German language, was equally estimable as a man. He was born at Ekau in Courland, December 26, 1724, and lost his father when about eight years old, but was so fortunate as to possess in his surviving parent not only a tender guardian, but a model for those virtues by which he afterwards distinguished himself. Having completed his studies at the university of Halle, he first became tutor in a private family, and in 1750 was appointed pastor of a small congregation in a retired part of the country, to whom and to the duties of his office he became so attached, that when a professorship at Halle was pressingly offered him, he refused to accept it, preferring to remain in obscurity, where he felt that he could be eminently useful. If he afterwards consented to quit his former living for the more lucrative one of Gränzhof, it was with no other interested motive than that of being thereby enabled to support a widowed sister and her five children. By this change too the sphere of his usefulness was greatly enlarged, for he became greatly followed as a preacher. In 1775 he was made dean of the diocese of Doblen; and in 1784 superintendent of church matters in the duchies of Courland and Semgallen; but he still continued to reside among his congregation at Gränzhof. He died July 21, 1802, regretted by all who knew him either as a man or as a writer. In the latter character his fame rests chiefly upon his 'Geistliche Lieder,' a collection of devotional songs, which may justly be regarded as models of that apparently easy, yet in reality exceedingly difficult species of composition. At once animated, simple, dignified, and breathing heartfelt piety, they are equally free from affected sublimity and bombast on the one hand, and from puerility or unbecoming familiarity on the other. They are the genuine effusions of devotional feeling regulated by cultivated taste.

NEAP or NEEP TIDES. [TIDES.]

NEA'POLIS. [NAPLES.]

NEARCHUS, the son of Androtimus, was a Cretan by birth, but an inhabitant of Amphipolis on the Strymon.

He accompanied Alexander in his invasion of Asia, and was appointed by him to conduct to the Persian Gulf the fleet which had been built on the Hydaspes. The narrative of this voyage, the earliest of which any account is given, was written by Nearchus himself; and though the original journal has been lost, Arrian appears to have given us, in his 'Indica,' everything of importance which it contained. Strabo and Pliny have also preserved some account of this voyage, but their narratives are full of mistakes and inconsistencies, and cannot be compared with the full and accurate account of Arrian.

Dodwell and some other modern critics have considered the journal of Nearchus, as preserved by Arrian, to be spurious; but its authenticity has been fully established by Gosselin (*Géographie des Grecs*, p. 25), Sainte Croix (*Examen Critique*, p. 250), and especially by Vincent (*Commerce and Navigation of the Antients in the Indian Ocean*, vol. i., p. 68-77).

The course of the fleet from the Hydaspes to the mouth of the Indus is described under ALEXANDER (p. 300, 301), who explored in person the mouths of the Indus, and sailed into the great Indian Ocean.

The fleet under Nearchus took its departure from a station south of Pattala, about nine miles from the mouth of the Indus, in the beginning of October, B.C. 326. After getting clear of the mouths of the Indus, the first place which they reached in the Indian Ocean was Krokela, which Arrian describes as a sandy island. This place appears to correspond to the modern Curachee, or Crotchey Bay, in which there is a sandy island, dry at low-water. At Krokela, Arrian places the commencement of the territory of the Arabii, an Indian nation, and its termination at the river Arabis.

After remaining one day at Krokela, the fleet proceeded to the west, keeping a promontory (ὄρος) named Eirus (*C. Monze*) on the right, and a low island, almost level with the sea, on their left, which ran so near the coast as to leave only a narrow channel between both. Having cleared this passage and doubled the cape, they came to a bay, or harbour, protected from the ocean by an island called Bibacta (*Chuřna*, or *Chilney*). This harbour Nearchus called by the name of Alexander, and here he determined to remain till the season should be more favourable for his progress. It has been already remarked that he left the mouths of the Indus at the beginning of October; and as the north-east monsoon does not commence till November, and only becomes settled in December, a delay of some time was almost unavoidable. Having remained at this place for twenty-four days, he continued his voyage, though the monsoon had not yet completely changed; but he proceeded very slowly for some days. The fleet anchored successively at Domæ, Saranga, Sakala, and Morontobara, or Morontobarbara, the position of which places cannot be determined, and afterwards arrived at the mouth of the river Arabis (*Sonmeanny*), which separates the country of the Arabii from that of the Oritæ. From the Arabis they proceeded twelve miles and a half to Pagala, and from Pagala nineteen miles to Kabana, an open and desert shore: between Pagala and Kabana they lost two galleys and a transport. From Kabana they proceeded twelve miles to Kokala, where Nearchus disembarked his men and formed a camp on the shore. Here Leonnatus, who had been left in the country of the Oritæ by Alexander with a particular charge to attend to the preservation of the fleet, joined them, and supplied them with provisions.

After remaining some days at Kokala, they proceeded thirty-one miles to the river Tomerus. This was the longest distance they had sailed yet in a day; and their progress corresponds to the change of the monsoon, which would become more fixed about this time. They remained six days at the Tomerus, where they found barbarians, shaggy on the body as well as on the head, and with nails sharp and long like the paws of wild beasts. Thence they proceeded nearly nineteen miles to Malana (*Ras Malin*), where Arrian fixes the boundary of the Oritæ and the commencement of Gadrosia. The whole of the coast from Malana to Cape Jask, a distance of 450 miles in a right line, was inhabited by the Ichthyophagi (fish-eaters), who lived almost entirely on fish. Their bread was dried fish, pounded and made into loaves or cakes; and even the few cattle which they had fed upon dried fish. Arrian's description of the coast and the people is confirmed by modern travellers, one of whom, quoted by Vincent, informs us that 'they have few ports, little corn or cattle; their country is a low plain and desert; their chief support is fish, of which they take some of a prodigious size: these they salt, partly for their use, and partly for exportation; they eat their fish dry, and give dried fish likewise to their horses and cattle.'

From Malana the fleet proceeded thirty-seven miles to Bagisara; and on the following day they sailed round a rock or promontory, which extended a considerable way into the sea (probably *Cape Arubah*), and proceeded successively to Kolta and Kalama (*Kalyba*), where they found the dates green. Opposite to Kalama was an island called Karnine, which appears to be the same as the modern Ashtola, or Sungadeep Island. From Kalama they proceeded twelve miles to Karbis; and thence, after doubling a high rocky promontory, which projected nine miles into the sea, and which is probably the modern Cape Passeenoe, they reached a safe harbour, called Mosarna, which must be looked for a little to the west of this cape.

At Mosarna Nearchus found a pilot, who undertook to conduct the fleet to the Persian Gulf, and from this time they sailed on each day a much greater distance. From Mosarna they proceeded in succession to Balomus, Barna, Dendrobosa (perhaps the Dendrobilla of Ptolemy), and Kophas, the position of which places is uncertain, with the exception of Kophas, which is perhaps the same as the modern Koppah. From Kophas the fleet sailed round Cape Gwadel, and proceeded fifty miles to Kyiza, where they did not land, as the coast was rocky and barren. On the following day they surprised a small town, probably situated on Gutter Bay, and obtained some corn, which they were greatly in want of. They afterwards anchored at a cape in the neighbourhood called Bageia; and thence proceeded about eighty-seven miles in two days to Kanasis, a town in ruins, probably situated on Choubar Bay. From Kanasis Nearchus sailed twenty-four hours without intermission to a desert coast, where he was obliged to anchor at some distance from the shore, as the distress of the people was now risen to such a height, that if he had suffered them to land, he had reason to suspect that they would not have returned on board. From this place they proceeded, in great want of provisions, to Kanate (*Tunka*), Troi, and Dagasira, and at length reached Badis, a place on the western side of Cape Jask, which separated the country of the Ichthyophagi and Karmania. At Badis they found corn, vines, and fruit-trees of every kind except the olive, a town inhabited, and the inhabitants ready to relieve their wants.

From Badis they proceeded fifty miles, and came to an anchor on an open coast, opposite Cape Maketa (*Ras Mussendon*), from which point Nearchus considered that the Persian gulf commenced. From Badis they proceeded forty-four miles, to Neoptana (near *Karroon*), in the Persian gulf. From Neoptana they sailed on the following day six miles to the river Anamis (*Ibrahim*), at the mouth of which was a town called Harmozeia, the name of which is still preserved in the celebrated island of Ormuz, in the neighbourhood. Near this place Nearchus landed his men, and ordered the ships to be drawn on shore; and learning that Alexander was only distant a journey of five days, he went with a few attendants to his camp, and was received by the king with marks of the greatest honour and respect. At first Alexander would hardly believe that the fleet had arrived in the Persian gulf in safety; and when he was assured by Nearchus of the fact, he is reported to have said, 'By the Grecian Zeus and the Libyan Ammon, I swear to you that I am more happy in receiving this intelligence than at being the conqueror of all Asia; for I should have considered the loss of my fleet, and the failure of this expedition, as a counterbalance to all the glory I have acquired.' So anxious was Alexander to establish a commercial intercourse between India and the western provinces of his vast empire.

After remaining a few days with Alexander, Nearchus returned to the fleet, and set sail again about the beginning of the following year (B.C. 325). During the third day's sail three of the ships grounded during a storm on a shoal off the western coast of the island of Oaracta (*Kishma*); but they got off when the storm ceased, and joined the fleet on the following day. The remainder of the fleet escaped the danger by sailing to the south-westward, and anchored at the islands called at present the Great and Little Tomb. On the following morning they sailed again to the mainland, leaving on their left the island Pulora (*Polior*), and after a

sail of two or three days arrived at Katæa (*Kaish, Guase*, or *Kenn*), a low desert island, opposite to which, according to Nearchus, is the boundary of Persis and Karmania on the coast.

From Katæa they proceeded along the coast of Persis, anchoring successively at Ila, opposite the island of Kaikandros (*Inderabia*); at Ochus, under a high mountain; at Apostani (*Shewar ?*), where they found many ships at anchor; at a bay, probably the same as the modern Nabend, on the borders of which were many villages with palm and other fruit-trees; at Gogana (*Congoon*), situated at the mouth of a mountain-stream called Areon; and at the river Sitacus, west of the modern *Ras Khann*, where Nearchus remained twenty-one days in order to repair and refit several of his ships, during which time he received a large supply of corn from Alexander. About the 1st of February they sailed from the Sitacus to Hieratis (*Khore*), a place well inhabited, and thence to Mesambria, and anchored at the mouth of a river called Padargos. Arrian describes the whole of this country as a peninsula, which corresponds most correctly with Aboushehr, generally called Bushire. Thence they proceeded to Taoke, near the mouth of the river Granis (*Khisht*), on which there was said to be a palace of the Persian kings, about 200 stadia up the country. Strabo (xv., p 728. *Casaub.*) also mentions a Persian palace near the sea, called Oke, which apparently is a shortened form of Ta-oke. From Taoke they proceeded in succession to Rhogonis (*Bunder Reight*), to Brizana, a winter torrent, and to the river Arosis, called Oroatis by Strabo, Pliny, and Ptolemy (*Tab.*), which, according to Arrian, divided Persis from Susiana.

At the Arosis they took in a supply of water for five days, as the pilots told them that no harbour could be gained without considerable danger, in consequence of the number of shoals which extended from the land far out into the sea. The whole of the navigation along the coast of Susiana was attended with great difficulty and danger; but the fleet eventually passed through the shoals in safety, and sailed up the river Pasitigris (*Karoon*), when Nearchus joined Alexander and his army, who where on their march from Persepolis to Susa. Vincent supposes that the expedition was concluded on the 24th of February, B.C. 325.

After the death of Alexander, we find that Nearchus was governor of Lycia and Pamphylia (Justin, xiii. 4), and that he attached himself to the fortunes of Antigonus, whom he accompanied in several of his expeditions. The time and manner of his death are unknown.

A very complete and interesting examination of the voyage of Nearchus is given by Vincent in the first volume of *The Commerce and Navigation of the Antients in the Indian Ocean*, from which the preceding account has been chiefly taken, compared with the maps of Beloochistan, and of antient and modern Persia, published by the Society for the Diffusion of Useful Knowledge.

The Greek text of Arrian, with some useful notes and a map, is contained in Schmieder's edition. [ARRIAN.]

NEATH. [GLAMORGANSHIRE.]

NEBRUS, one of the family of the Asclepiadæ, and the most eminent physician of his day, lived in the island of Cos, about 580 years B.C. The Amphictyons, having consulted the oracle of Delphi, in consequence of the plague breaking out among their army while besieging the town of Crissa in Phocis, were directed to fetch from Cos 'the young of a stag, together with gold.' This was interpreted to mean Nebrus* and his son Chrysus, who accordingly joined the camp of the Amphictyons, where the former helped to reduce the town by poisoning the water; and the latter was the first person who mounted the wall at the time of the general assault. (Thessali *Oratio ad Athen.*, *apud Hippocratis Opera.*) For the Crissæan war see Strabo, ix., p. 418; and Pausan, *Phoc.*, 37, who attributes the poisoning of the water to Solon.

NE'BULÆ. [STARS AND NEBULÆ.]

NECESSITY, in metaphysics, according to the common definition, is that quality of a thing by which it cannot but be, or whereby it cannot be otherwise. When, in a proposition which affirms any thing to be true, there is a fixed invariable connection between the subject and the predicate, then that thing is understood to be necessary. Necessity is opposed to chance, accident, contingency, and to whatever involves the idea of uncertainty and of possible variation. It is usually distinguished into logical, physical, and moral necessity. Logical necessity consists in the circumstance that the conception of something being different from what it is, implies a contradiction or absurdity. In this sense, it is necessary that two and two should be four, that converging lines, if produced far enough, should meet: thus also the eternal existence of being generally is necessary, as are innumerable other truths. Physical necessity has its origin in the established order and laws of the material universe. The necessity, in this case, differs from that formerly specified, in that it is only conditional, is a necessity of consequence. Everything that takes place in the natural world happens by virtue of certain laws: these laws are known by experience to operate regularly and uniformly; and the results of their operation are hence, with reference to them, said to be necessary. When we ascribe anything to chance, we merely state our ignorance of the law or laws to which its existence is to be referred. Physical necessity is founded on the relation of cause and effect. By tracing back this connection, we arrive at the knowledge of a great first cause, that is God, who is the only Being existing independently and by an absolute necessity. His infinity and other attributes are necessary; and it is evident that the purposes and acts of such a Being must also be necessary, being determined by that necessity by which he is what he is. He must always resolve and act with the most perfect wisdom, justice, and goodness. To affirm the contrary would be to affirm that he is different from what he is. Moral necessity has reference to the volitions and actions of rational agents, and is intended to express the connection between these volitions and actions, and certain moral causes, as inclinations, desires, or motives generally. Whether there be any connection which, strictly speaking, may be termed necessary, between such motives, and the resolutions of the human will, and the consequent actions, or whether, independent of them, the will has a self-determining power, is an inquiry which has largely engaged the attention of both philosophers and theologians. It is one of great interest, and which has an important bearing, on whatever relates to man as the subject of a moral government. [WILL.]

The doctrine of a universal necessity, or fatalism, was maintained by many of the antient philosophers; and formed the characteristic tenet of the Stoical school. According to it, necessity was to be considered as an inevitable and all comprehending principle, to which gods as well as men were subject. Everything was conceived to exist in a necessary series of causes and effects—the whole constitution of nature—the modes and circumstances of all things without exception—being irresistibly and unchangeably determined. Hence the language of Seneca, the elegant expounder of the opinions of this sect, in his treatise 'On Providence:'—'The same necessity binds both gods and men—Divine as well as human affairs proceed onward in an irresistible stream—one cause depends upon another—effects are produced in an endless series—nothing is the offspring of chance.' Democritus held opinions closely resembling the Stoical doctrine of fate; as also Heraclitus, the founder of the sect that went by his name. In modern times, the doctrine of necessity, especially in regard to the human will, has been defended by Hobbes, Leibnitz, Priestley, Hume, Kaimes, Hartley, and many others.

NECKAR, river. [RHINE.]

NECKER, JAMES, son of a professor of law at Geneva, was born in 1734. He was sent to Paris in his youth, and was employed in the house of Thelusson, the great banker, who, after a time, in consequence of his abilities and the services which he had rendered to the house, took him into partnership. In the course of twelve or thirteen years, Necker realised a very large fortune by various successful speculations, and retired from business at forty years of age. He now began to aspire to official situations, and wrote several works on financial affairs, which made him favourably known. He wrote concerning the French East India company, and also upon the corn-laws, 'Sur la Législation des Grains.' His 'Eloge de Colbert' obtained a prize from the French Academy. He afterwards wrote a memoir upon the French finances, suggesting the means of making up the deficiency in the revenue, and forwarded it to the minister Maurepas, the president of the council of finances. The president, being delighted with it, obtained for the author, from Louis XVI., after some hesitation on account of Necker being an alien and a Protestant, the appointment of

* νεβρὸς, in Greek, signifies 'a fawn,' and χρυσὸς, 'gold.'

director of the treasury, in 1776. This was a new office, and was created for the purpose of giving assistance to that of comptroller-general, which was filled by the counsellor of state Taboureau de Réaux, a mild and unassuming man, who, feeling his inferiority to Necker, resigned his place in the following year. Necker was appointed director-general of finances, in June, 1777, but without a seat in the council. That was a critical period; the finances had been long in a state of great embarrassment, and the impending war with England on account of the American colonies required a great increase of expenditure. Necker, being averse to imposing new taxes, endeavoured to make up the deficiency by economy and loans. [LOUIS XVI.] In 1781 he published his 'Compte Rendu,' which disclosed for the first time the state of the revenue and expenditure of France, and made him numerous enemies. In order to counteract their intrigues, Necker asked for a seat in the council as a mark of the king's confidence, but this being refused on the score of his religion, he tendered his resignation, which was accepted, in May, 1781. He withdrew to Switzerland, where he purchased an estate at Copet, on the banks of the Leman Lake, and here he wrote his work, 'Sur l'Administration des Finances,' 1784. 'Both Necker and his predecessor Turgot,' says a contemporary writer, 'worked for the public good, and both made war against abuses. But Turgot had the disinterestedness of a philosopher and a philanthropist who entirely forgot himself for the good of the state and of mankind. Necker was disinterested, but only in money matters, for he was tormented by the ambition of fame and popularity. Turgot had faith in his principles; Necker confided in himself. Turgot had fixed ideas on legislation, and he wished to give a durable government to France; Necker combated only partial abuses, and appeared to have no settled notions of the science of government. . . . Turgot wished to give to the French a political and moral education; he wished to form public opinion; Necker believed that public opinion in France was very enlightened, and he bowed himself before it. The former spoke to the people as a legislator, the other as a courtier of the people.' In his retreat however, after his second resignation, he altered his tone. 'Public opinion,' he says, in the preface to his work 'De l'Administration de M. Necker, par lui-même,' 1791, appears to me no longer as it did once. The respect which I felt for it has been weakened since I have seen that opinion influenced by the arts of the wicked, since I have seen it waver and tremble before men whom it ought to have rightly estimated and marked with its scorn and reprobation.' 'Necker's first resignation however was much to be regretted; it was a loss to France at a critical moment, and it was a great fault on his part, for he might have maintained himself in office; but his unconquerable self-love prevented him. He fancied that they could not do without him, and that he would be soon recalled, and thus become all-powerful. He was mistaken; and when at last he returned to office, the situation of the state was greatly changed, and circumstances had become such as to require talents very superior to his.' (Droz, *Histoire du Règne du Louis XVI.*, b. 11, 1839.)

In 1787 Necker returned to Paris, where he wrote against Calonne, who had just been dismissed from his office of comptroller-general of the finances, and he was, in consequence, banished from the capital, but was soon after recalled. In the following year (August, 1788), on the resignation of Brienne, and at the suggestion of that minister, Louis XVI. appointed Necker director-general of finances, as the only man capable of restoring order in the administration. The king had already promised the convocation of the states-general, and Necker urged him to keep his promise. But he failed as a statesman, in not arranging beforehand a plan for the sittings of those states, so as to prevent the collision that took place on their first meeting. In fact Necker was a financier, but no general statesman; he was a philosopher and a man of letters, but not a jurist or a legislator, and he was thus considered by a man well qualified to judge of these matters. [MIRABEAU.] His second ministry was short. Unable to check or direct the popular storm, and not enjoying the confidence of the court, Necker, unwilling to become a watchword of the agitators, offered privately to Louis XVI. to quit his place and the kingdom, if he thought his absence would tend to calm the public effervescence. On the 11th of July, 1789, the king wrote him a confidential note, requesting him to set off quickly and privately. Necker obeyed, and set off for Switzerland that very night. But this step, instead of preventing, only precipitated the Revolution. After the taking of the Bastille, the National Assembly demanded the recall of Necker, and Louis complied. Necker was received in triumph, but his popularity was short-lived. He did not go far enough to please the movement-men. In December of the following year, 1790, he gave in his resignation to the National Assembly, which received it with cool indifference. He spent the remainder of his life in Switzerland, in retirement and study, and wrote several political tracts. He had written, several years before, a work, 'De l'Importance des Opinions Religieuses.' He died in April, 1804. His daughter has become celebrated as Madame de Staël. [STAEL.]

NECRO'SIS (from νεκρός, 'dead') is the term applied particularly to mortification or death of bone. Its general causes and the mode of reparation are the same as those of mortification generally. [MORTIFICATION; INFLAMMATION; BONE.]

NECTARINE. [PEACH.]

NECTARINI'ADÆ. [SUN-BIRDS.]

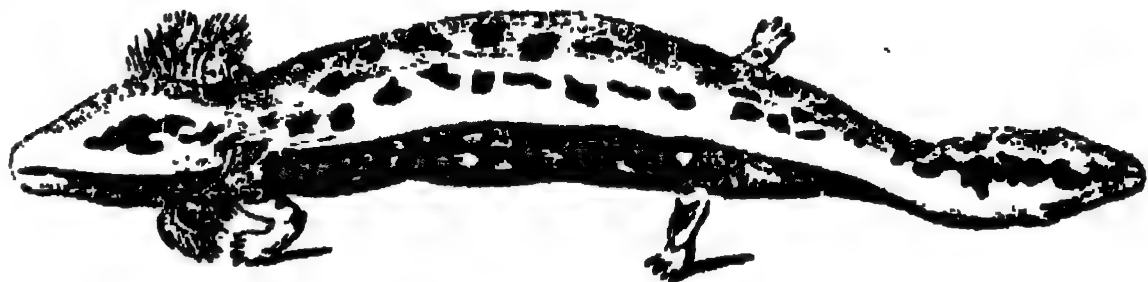
NECTO'PODA. [NUCLEOBRANCHIATA.]

NECTU'RUS, M. Rafinesque's name for a genus of *Derotremata*, placed by Cuvier between the *Axolotls* [AXOLOTL] and the *Proteii* of Laurenti. This form is the *Menobranchus* of Harlan and the *Phanerobranchus* of Fitzinger.

Generic Character.—Four toes on each foot. A row of teeth on their intermaxillaries, and another, parallel but more extended, on their maxillaries.

Necturus lateralis (*Triton lateralis* of Say; *Menobranchus lateralis* of Harlan; and *Phanerobranchus* of Fitzinger) is the species best known, and will serve for an example of the genus. It is olive, with blackish spots above, and a blackish stripe running from the muzzle just above the eye and reaching to the branchiæ, where it becomes continuous with the blackish belly, which is variegated with olive spots. The size is considerable; some say as much as two or three feet in length.

Geographical Distribution.—The great North American lakes.



Necturus lateralis.

NEDJED, or NEDJD. [ARABIA.]

NEEDLE MANUFACTURE. This branch of industry is supposed to have originated in Spain, from the circumstance of the name *Spanish needles* being originally used in England, although the art was brought here from Germany. Needles were first made in England about the year 1565, by Elias Crowse or Krause, a German, who settled in London. This manufacture can never become one of much importance to a nation, and it is not therefore surprising that we are without any historical details of its progress. The reputation long enjoyed by *Whitechapel* needles points out the particular locality in London where the manufacture was carried on. At this time, the largest number of needles are made at Hathersage in Derbyshire, in Warwickshire, in and near Birmingham, and also at Redditch in Worcestershire.

The manufacturing processes are as follows:—Soft steel wire of the required thickness is first cut into lengths of about five inches, and these lengths, being placed together in a bundle, are bound together by means of iron rings, five inches in diameter, placed at each end of the bundle. This bundle is then placed on a cast-iron table, and rolled to and fro upon it, under the pressure of a flat bar of iron, by which means the wires are made perfectly straight. About a dozen and a half or two dozens of these wires are then taken by the grinder, and together are pointed on a small dry grindstone. This process requires considerable dexterity for its proper accomplishment, as each wire must be so held by the grinder as to revolve in contact with the grindstone. It is this dry-grinding which makes the trade of a needle-grinder so injurious to health, through the inhaling of the small particles of steel which are thrown off during the operation. A preservative against this evil has been pro-

vided: this consists of a mask of magnetic wire-gauze, worn so as to protect the mouth, and the particles of metal, being attracted by this means, are prevented from passing into the lungs. It is but seldom however that the grinders can be induced to wear these masks.

When the pointing is finished, the wires are cut into the required lengths, and the holes or eyes are perforated. This operation is usually performed by females. The tools employed are, a small anvil fixed on the work-bench, a hammer, a finely-pointed and well-tempered steel punch, a pair of plyers, a file, and a block of lead. The woman first slightly flattens the unpointed end by a stroke of the hammer, then makes an indentation on one side by means of the punch and hammer; the needle is then taken from off the anvil, and, being placed with the indented side downwards on the block of lead, the perforation is completed by striking with the punch and hammer on the opposite side of the needle. Holding then the needle in the plyers, the head is somewhat bent, and with the file the *guttering* is performed, which is the forming of the channel that may be seen on each side where the perforation is made. The head is then smoothed by passing the file over it. Needles to which the name drilled-eyed is applied are perforated in the manner here described, but the additional process is used of smoothing the eye by means of a drill after it is perforated.

For making the eyes and gutters in large needles, machinery is employed. The wires used for making these needles are pointed at both ends, and the channels and eyes are formed in the middle, when the two needles thus made are cut asunder, and their heads smoothed with a file.

These operations being performed when the steel wires are in a soft state, they are more or less bent, and must be straightened, which is done by rolling them on one plate of metal under the weight of another. The needles are then placed, many thousands together, in a kind of crucible, and covered over with ashes, when they are put into a close furnace and exposed to a cherry-red heat. When this degree of heat has been attained, the crucible is withdrawn, and the needles are dropped into cold water, from which they are taken out and put upon an iron plate almost red hot, where they are turned about so as to cause the heat to apply equally to all, and as fast as the needles become of a blue colour, they are removed as being of a proper temper.

Such of the needles as now appear crooked are straitened on a small anvil by blows from a hammer.

The needles are next ranged in parallel rows upon a course cloth, which has been smeared with a mixture of oil, soft soap, and fine emery powder. In this cloth from 40,000 to 50,000 needles are rolled up, and several of these rolls are placed together in a machine like a mangle. The rolling to which they are here subjected is continued, by means of steam or water power, for two and sometimes three days, during which time the cloth wrappers, being worn out, require to be once or twice replaced by new ones. When taken out, after this rolling, the needles are perfectly bright.

They must now be sorted, by placing the heads of all in the same direction. This task, as well as that of separating broken and spoiled needles from such as are sound, is performed by children. Placing a finger-stall of cloth on the fore-finger of the right hand, the ends of about a dozen needles are pressed against it, when such as have their points next to the cloth stick into it, and are withdrawn with ease. The needles thus arranged are then placed, a quarter of a hundred together, in papers for sale.

It is not possible to form any satisfactory estimate of the number of needles made and used in this kingdom, neither do we know the quantity nor value of such as are exported, as they pass at the Custom-house, with a great variety of small objects, under the general name of haberdashery. Needles of English make are very generally esteemed for their superior quality.

(Babbage's *Economy of Machinery and Manufactures;* Lardner's *Cabinet Cyclopædia*, 'Manufactures in Metal.')

NEEFS, PETER, called 'the Old,' born at Antwerp in the year 1570, was a disciple of the elder Henry Steenwyck, whose manner he closely imitated. He painted views of churches and convents, especially interiors, preferring those in the Gothic style of architecture. He possessed a profound knowledge of perspective, and represented his subjects, with all their rich ornaments, and every member of the architecture, with strict truth, and yet without betraying the appearance of anxious labour. Every object is marked with minute precision, and finished with an exquisite touch and a light pencil. His bright clear pictures, in which he avoided the darkish brown colouring sometimes observable in the works of his master Steenwyck, are the most esteemed. Being an indifferent designer of figures, he often got F. Francks, Van Thulden, Velvet Breughel, or Teniers, to paint the figures; those of the two last greatly enhance the value of the pictures of Neefs.

He died in 1651, at the age of eighty-one. His son, Peter Martin (called 'the Young') painted in the same style, and chose the same subjects as his father, but was by no means equal to him.

NEER, ARNOLD VANDER, born at Amsterdam in 1619, is well known to connoisseurs and artists both by the peculiarity of his style and by the handling and transparence of his landscapes. His subjects are chiefly views of villages with fishermen's huts on the low banks of rivers and canals. His pencilling is remarkably neat, his touch free and clear, and his imitation of nature faithful. His reputation is founded on his moonlight scenes, in which he has never been excelled, and perhaps never equalled. The lustre of his skies about the moon, and the reflection of the beams on the water, whether calm or slightly rippled, are inimitable. His genuine pictures are highly prized all over Europe. In some instances they are rather too black, probably from the effects of time. He died in 1683, aged sixty-four.

NEER, EGLON HENDRICK VANDER, son of the preceding, was born at Amsterdam in 1643. He studied first under his father, and afterwards under Jacob Vanloo. He was well versed in all the branches of the art. In history, his composition is skilful and his drawing correct; his portraits, both large and small, are spirited and well coloured; and his conversations have all the excellencies of Terburg. He lived first at Paris, then at Orange, and lastly at the court of the elector palatine at Düsseldorf, where he died in 1703.

NE EXEAT REGNO, the name of a writ which issues out of Chancery on the application of a party complainant, to prevent his debtor from leaving the realm. The writ is directed to the sheriff of the county in which the debtor is; and after reciting that 'it is represented to the king in his Chancery on the part of the complainant against the debtor, the defendant, that he the said defendant is greatly indebted to the said complainant, and designs quickly to go into parts beyond the seas (as by oath made on that behalf appears), which tends to the great prejudice and damage of the said complainant,' commands him to 'cause the said debtor to give sufficient bail or security, in the sum of l., that he will not go, or attempt to go, into parts beyond the seas, without leave of the said court;' and in case the said debtor shall refuse to give such bail or security, the sheriff is to commit him to prison until he shall do it of his own accord, &c.

The question which always arises on application to the Court of Chancery for this writ, is nothing more than this: whether the plaintiff has made out a case which is conformable to the terms of the writ, as interpreted by the decisions of the court.

The writ cannot be applied for unless in a suit, that is, unless a bill is already filed; but a plaintiff may apply for it in any stage of a suit, whether the writ is prayed for by the bill or not. The plaintiff cannot have the writ if he is out of the jurisdiction. There must be a debt in equity actually due at the time when the writ is applied for; and the writ will not be granted for a demand on which a party can be held to bail at law. The application for the writ must be accompanied with an affidavit swearing positively to the debt, except where the bill is for an account, in which case it it sufficient if the plaintiff swear that he believes there is a balance in his favour; or except where there is other decisive evidence of the debt, such as may appear from the master's report absolutely confirmed, or from admissions in the answer. The affidavit must also show that the defendant is going abroad, or it must show facts which prove that conclusion, and that the debt will be in danger if he quit the realm. The writ may be moved for ex parte, and it issues until answer and further order. A defendant may apply to discharge the writ on putting in his answer.

It is unnecessary to enter into further particulars here.

This writ is founded on the real or supposed prerogative of the king to restrain his subjects from departing from the realm. The 'Natura Brevium' contains two forms of

writs, one of which has for its object to restrain a clergyman from going abroad without the king's licence, and commands the sheriff to take security from him or commit him to prison; the other has for its object to prevent a layman from going abroad without the king's licence; but it requires no security from the party, and differs in several other respects from the other writ. These writs are both entitled De Securitate Invenienda, &c., and seem to be in substance, though not in name, writs of Ne Exeat Regno. From the former of the two the present writ of Ne Exeat seems to be derived.

It is said that the object of the writ, as applied to clergymen, was to prevent them from having frequent intercourse with the Papal see. Whether the prerogative on which these writs were founded was a usurpation on the part of the crown or not, is a matter which has been somewhat discussed. The opinion that such a power as that which is exercised by this writ 'appears to have been unknown to the antient common law, which, in the freedom of its spirit, allowed every man to depart the realm at his own pleasure' (Beames), is a vague surmise, expressed in language equally vague. This writ, which was originally designed solely for political purposes, has now been applied, as already explained, to the object of restraining a debtor from evading his creditor's demand by quitting the realm; this application has been sanctioned by long usage, the commencement of which is now unknown.

(*A Brief View of the Writ Ne Exeat Regno*, by Beames.)

NEGAPATAM, a town and port on the Coromandel coast, in 10° 46′ N. lat. and 79° 55′ E. long. The Portuguese had formerly a settlement here, which was taken from them in 1660 by the Dutch, who added materially to its defences, and made it their principal station in that quarter. They established a mint for coining gold money, and carried on an extensive trade from the port. The fort fell into the hands of the English, after an obstinate resistance, in 1781, and since then the European inhabitants have deserted the place. Many of the houses fell quickly into ruins, and others were pulled down, such of the materials as were of value being carried away to Madras. The native town is likewise much decayed, and the population is greatly diminished. The trade at present is quite inconsiderable, being almost wholly confined, as far as Europeans are concerned, to the procuring of refreshments for ships that touch at the port for that purpose.

NEGATIVE AND IMPOSSIBLE QUANTITIES. If the plan of this work had permitted detailed treatises on different branches of science, the subject before us would have fallen under the head of ALGEBRA, and would have been fully treated in the description of the difference between algebra and arithmetic. As it is, the present article and that on OPERATION will embrace the consideration of those peculiar abstractions the attainment of which distinguishes the *science* of algebra from the *art* which was cultivated by the Italians of the sixteenth century

In the oldest treatises on algebra which exist there is mention of a modification of quantity unknown in arithmetic, called *negative* quantity, as distinguished from *positive*. In the VIGA GANITA we find this distinction and the rules for its use precisely as in modern treatises: one of the commentators says that negation is contrariety; and the 'Liliwati' contains the geometrical interpretation of a negative line, namely, a line measured in the direction contrary to that of a positive line. The commentator says that Patna is fifteen yojanas east, and Allahabad eight yojanas west, of a place called Varanasi; 'the interval or difference is twenty-three yojanas, and is not obtained but by addition of the numbers. Therefore, if the *difference* between two *contrary* quantities be required, their *sum* must be taken.' Surely it will be said that algebra began in a strange confusion of ideas; but yet the fault is rather in expression than in conception. An art was in existence presenting undoubted means of discovering truth, commencing with a generalization of which the use was obvious, but not the meaning. In Diophantus we find the common rule announced as a definition (without even a previous notice of the distinction of quantities) in terms as broad as the following: '*Λεῖψις ἐπὶ λεῖψιν πολλαπλασιασθεῖσα ποιεῖ ὕπαρξιν*,' &c.; literally, 'Defect upon defect repeated, makes existence.' In Mohammed Ben Musa [MUSA] the rules are announced in the same way, though the separate existence of positive and negative quantities does not seem to be assumed: it must be remembered that this work was written for popular use. The European promoters of algebra, with the exception only of Vieta, adopted the use of two species of quantities, positive and negative, with the explanation above noticed. Vieta not only avoided the negative quantity, but, as far as he could, dispensed with subtractive terms and subtraction itself. He discards the double nature of quantities in the words 'Plus autem vel minus non constituunt genera diversa.'

It is not our intention to follow the earlier algebraists through their different uses of negative quantities. These creations of algebra retained their existence, in the face of the obvious deficiency of rational explanation which characterised every attempt at their theory. Newton and Euler distinctly admit the existence of the quantity less than nothing: the latter asserts that a man who has no property and is in debt 50 crowns, would only have nothing if any one else made him richer by a gift of 50 crowns, and therefore begins with 50 crowns less than nothing. Elementary treatises for the most part try to append an explanation of negative quantities to an algebra which is nothing more than arithmetic, instead of introducing those new abstractions which are the basis of the separate science: so that algebra, instead of being systematically learnt, is collected by slow and often dubious steps from arithmetical examples, in which the rules of operation of the former science are employed, preceded by the principles of the latter. Few therefore acquire a real perception of the meaning of the subject, except those who study mathematics to great extent. It is matter of notoriety that difficulties attend the beginner in algebra of a nature totally different from those which are found in geometry; so that while a person who has read a few books of Euclid may be imagined capable of writing an intelligent commentary on what he knows, another who has mastered a common elementary treatise on algebra is conscious only of a great increase of working power, with a glimmering of principles which owe their reception more to the never-failing accuracy of their results than to native evidence or logical deduction from easily admitted truths.

It is but recently that such a view has been given of algebra as will at once explain both the distinction of positive and negative quantities, and the difficulty attending the square roots of negative quantities, usually called *impossible* quantities. We shall endeavour to ascend to this view of algebra, on the supposition that the student has read what beginners usually read, and is well acquainted with the common operations. We must however premise that, as in all other cases where the first principles of a science have been matter of dispute, it by no means follows that one view of the subject is the most easy to every mind. Something must depend on the intellectual constitution of the individual; and if this be most probably true in geometry, the remark applies with still greater force to algebra.

The first abstraction which meets us in arithmetic follows the transition from actual magnitudes (concrete numbers, so called) to their numerical representations. We then find general properties of numbers, in which we learn to consider number independently of a specific concrete unit. Thus we see in $7+5-3=7-3+5$ a relation equally true, whatever may be the nature or magnitude of the unit. When we drop the concrete number and rise to the abstract, we gain something more by the transition than immediately appears; and this the student should particularly note, because some of the succeeding difficulties which attend the passage into algebra are very similar in character, though preceded by a stranger and harder process. The operation of multiplication takes a power and a property which it had not before: thus if we denote concrete number by Roman numerals, and if we speak of yards, it is clear that $5 \times$ VII $=$ XXXV, or seven yards taken five times is thirty-five yards. But we may not therefore say that VII $\times 5 =$ XXXV, for VII $\times 5$, the number 5 multiplied by 7 yards [MULTIPLICATION], is an incongruous and unmeaning set of words, and it would be equally improper to say that it *is* and that it *is not* thirty-five yards. In abstract numbers no such caution is necessary; 7×5 and 5×7 are both the same. If men had never considered *number* independently of magnitude measured or repeated by it, the arithmetician would have confounded VII $\times 5$ and $5 \times$ VII, because he would soon have found that no false results would have sprung therefrom; while VII $\times 5$ would have been a sort of impossible quantity, useful in practice and difficult in theory.

We are now on the ground of abstract arithmetic, and on

examining the four fundamental operations, we see no difficulty in either addition, multiplication, or division. As soon as we have mastered the subject of fractions, and have clearly admitted the introduction of a *part* of a repetition [MULTIPLICATION], we say as follows: let a and b be any two numbers or fractions, and $a+b$, ab, and $a:b$ must be real numbers or fractions, assignable by demonstrated operations as soon as a and b are assigned. But there is still a restriction upon the possibility of subtraction; $a-b$ has no imaginable existence, unless a be greater than b; when $a=b$, the magnitude of $a-b$ vanishes entirely, and when a is less than b, the direction to perform $a-b$ is just the same as asking for a part which shall be greater than the whole of which it is a part. If we confined ourselves to particular arithmetic, in which all numbers used have specific values, it would most likely be thought of no use to carry the subject further, and in one point of view correctly; that is, it would be of little moment to deduce methods by which an individual so careless as to write down and operate upon such a symbol as $3-4$ might be enabled to arrive at a subsequent correction of the mistake which a glance at the symbol should show him he has made. But when we use general symbols of number, we are liable to mistakes of two kinds, both dependent upon our liability to invert the order of terms of which the less should be subtracted from the greater.

First, we may mistake the nature of the quantity which results: thus if it be part of the conditions of a problem that I pay £a and receive £b, and if the application of the conditions requires that I should state how much I gain or lose, the answer should be either a loss of £$(a-b)$ or a gain of £$(b-a)$, according as a or b is the greater. We have then the choice between adopting one of these with the chance of being entirely wrong, or of working the problem in two distinct ways. And if it should happen that the conditions of the problem present this alternative in six distinct instances (and sometimes it happens oftener), there would be no less than 64 cases of solution, all, arithmetically speaking, essentially different in the mode of obtaining the answer, whether the answers obtained be the same or different.

Secondly, we may make an error of the same kind in the details of operation. For instance, suppose we have $a+b-c$, which it is convenient to exhibit in the form of a altered by one single addition or subtraction. If we assume an addition, and write $a+(b-c)$, we may be in error; for if b be less than c, the proper alteration is $a-(c-b)$.

It is evident that both species of mistakes are precisely of the same kind. Let us call them, for distinction, errors of interpretation and errors of operation, and let us show first that an error of interpretation will produce the error of operation and no other. If, in the first problem, we suppose $a-b$ to be lost where $b-a$ is really gained, and if the problem, for instance, require the result of the preceding to be annexed to a loss x, we shall suppose there is altogether a loss of $x+(a-b)$, whereas it should be a loss of only $x-(b-a)$. Secondly, the error of operation will produce the error of interpretation, whenever any interpretation is made; for when we look at $x+(a-b)$ as a loss, we shall evidently suppose it to be more of a loss than x, or that $a-b$ is lost besides; whereas, had we looked at $x-(b-a)$, we should have inferred that there is a less loss than x, or if x were lost, $b-a$ was gained. Now the first step of the young algebraist, before he attempts any transition from universal arithmetic to algebra, must be to examine by many instances the effect of both classes of errors upon the subsequent proceedings and results. We shall here only state the truths at which he will finally arrive, with an example of each. The beginner cannot, as the proficient may do, see a sufficient reason for these results in the common rules of algebraical operation; and we should doubt that anything but a large number of examples would serve to give him the necessary insight into the conclusions.

1. The mistake of operation, how often soever repeated, and how complicated soever the deductions which may be drawn from it, produces no result in any way different from that of the correct process; that is, its result can be reduced to the result of the correct process by the use of no more than those rules which apply in the rational process.

Thus if $x+a-b$, wrongly taken to be $x+(a-b)$, b being greater than a, be multiplied by $x+p-q$, wrongly taken as $x+(p-q)$, q being greater than p, we find as the (supposed) product

$$x^2+(a-b+p-q)\,x+(a-b)\,(p-q),$$

to which the application of the common rules gives

$$x^2+ax-bx+px-qx+ap-bp-aq+bq,$$

precisely the same as the product of $x+a-b$ and $x+p-q$. The reason of this is as follows:—In all the rational cases of the four operations, a term in the construction of which two signs are used has $+$ before it, if those two signs be alike, and $-$ if they be unlike, as in

$$a+b-(c-d), \text{ or } a+b-(0+c-d)$$
$$=a+b-c+d$$
$$(a-b)\,(c-d) \text{ or } (0+a-b)\,(0+c-d)$$
$$=0+ac-ad-bc+bd.$$

If then a term were subjected to the signs $++$, it would make no difference if the same term were subjected to the signs $+--$, for the effect of $--$ is the use of $+$. If then we take $x+a-b$ wrongly as $x-(b-a)$, we see that when we come to add this, say to c, we have

$$c+\{x-(b-a)\}$$

in which a, before it is disengaged, must come under the signs $+--$, or, if the phrase be less objectionable, under the application of the rules to those signs, successively. But the correct process would give

$$c+\{x+(a-b)\}$$

in which a falls under the application of the rules to $++$; and such application to $++$ gives the same result as that to $+--$, necessarily and demonstrably, though in one of the two applications there is the symbol of absurdity. In the same way the other cases may be proved, whence it follows that however many of these simple operations may be performed, no result can arise except either that of the correct operation or one which may be brought to it by the operations on signs, already described.

We must here pause to remind the reader that errors, however palpable and admitted, are not necessarily productive of error. *True* reasoning, on *true* principles, *must* lead to truth; but if for true we write false, and for truth falsehood, we have no longer any right to say *must*, but only *most probably will*. If then we can show of a particular class of errors that, used in a certain way, the results agree with those of true reasoning on true principles, we may demand the use of those errors as demonstrated means of finding truth. The mind of man would never stop at such a point; but, for all that, we have the conclusion, as a logical consequence of the rules of arithmetic, that the mistake of the impossible subtraction introduced in operations, and not having previously vitiated the interpretation by which the fundamental objects of operation (equations) were deduced from the conditions of the problem, will produce no falsehood in the result.

2. Let us now examine the consequences of the error of interpretation. The effect of this is, that we write $a-b$ instead of $b-a$, but at the same time we suppose the quantity of which we are thinking to be of a diametrically opposite character to that which it ought to have. But also at the same time we add this symbol where we should subtract it, and *vice versâ*; so that where we should take $a-b$, and add, giving $c+(a-b)$, we make one mistake in taking $b-a$, and another in subtracting, giving $c-(b-a)$. When mere rules come to be applied, we find the same result from both, namely, $c+a-b$ and $c-b+a$. We might then so manage as to elude the actual presentation of the negative quantity, as in the following problem:—Two persons are now aged 50 and 40; at what date is (was, or will be, as the case may be) the first twice as old as the second? Let us suppose that we reach the date by going a years forward and afterwards b years back from the epoch to which we then come: here is a supposition which is perfectly competent to yield any result, before or after the present epoch, by properly assuming a and b. But we must now choose a supposition; let it be that the ratio in question exists at some future time, that is, a is greater than b. In $a-b$ years then the thing happens; consequently,

$$50+(a-b)=2\,(40+(a-b)\,)\quad .\ .\ (1)$$
$$50+a-b=80+2a-2b\quad .\ .\ .\ (2)$$
$$80+2a-2b-50-a+b=0$$
$$30+a-b=0$$
$$b=a+30.$$

Or any number of years forward and 30 more years back is all the answer the conditions of the problem will give, or the event took place 30 years ago. But the correctness of this reasoning is only a semblance, for the result contradicts the supposition on which it was obtained, namely, that a is

greater than b. To increase 50 by the excess of a over 30 *more than a* is beyond the power of the arithmetician. If then it be taken that a is less than b, or that the event happened $b-a$ years ago, we have

$$50-(b-a)=2(40-(b-a)) \quad . \quad . \quad (3)$$
$$50-b+a=80-2b+2a \quad . \quad . \quad . \quad . \quad (4)$$

and (4) is the same as (2); so that we arrive at the same result as before, and find our conclusion to justify the supposition on which it was made. The steps (1) and (3) differ to the same effect as if an error of operation had been made on (4) or (2) in retracing the steps.

In the preceding, by the use of two symbols, a and b, we have enabled ourselves to obtain a correct and intelligible answer, even by the incorrect process, since we end with the determination of $b-a$ (=30), even where we reasoned on $a-b$. If however we had represented our unknown quantity by a single symbol, x, our first process would have stood as follows:—

$$50+x=2(40+x)=80+2x$$
$$x=50-80$$

And the answer is obviously impossible. Our second process is,

$$50-x=2(40-x)=80-2x$$
$$x=80-50=30.$$

From such instances as the preceding it may be collected that an error of interpretation, which causes us to write $a-b$ instead of $b-a$, will, in finding the value of $a-b$, cause an impossible subtraction to appear; and *vice versâ*, that the appearance of an impossible subtraction in the result can arise from nothing but a primitive error of interpretation in fixing the nature of that result. This point must be well ascertained by every beginner from repeated instances.

Such a result as $3-8$ may be written $3-3-5$, or $0-5$; so that the error of attempting to subtract 8 from 3 is reducible to that of attempting to subtract 5 from nothing. At our present point we can say that the occurrence of $0-5$ shows us that the result which we supposed ourselves about to obtain was diametrically wrong in quality in our previous supposition: thus in the preceding problem we found $50-80$, or $0-30$, and the real answer is 30 in its magnitude, but instead of being, as we supposed, 30 years after the present time, it is 30 years before it.

Having arrived at this point, the earlier algebraists at once received such symbols as $0-5$ and $0-30$, which they wrote -5 and -30, into the list of algebraical objects of reasoning, calling them *negative* quantities, and treating them as diametrically opposite in meaning to 5 and 30, which should for comparison be written $0+5$ and $0+30$. These they called *positive* quantities. And, because, in all possible subtractions the remainder is less than the minuend ($a-b$ is less than a) they called $0-5$ less than nothing. The fault committed by elementary writers, in beginning algebraical works by an exhibition of these definitions without the least warning of the manner in which arithmetical terms had been extended, converted the whole science into a mystery.

If we extend the notion of quantity so as to give different names to those of diametrically opposite kinds, we may call one set of quantities direct, and the others inverse. Thus property and debt, distance north and distance south, time before and time after, ascent and descent, loss and gain, progression and retrogression, &c. &c., are of different kinds; either of any one pair may be called direct, but the other is then inverse. And in circumstances which require the addition of the direct quantity, the subtraction of the inverse is equally required: thus whatever an increase in A's property will augment, a diminution of it will diminish; whatever distance on a line progression on that line will increase, retrogression will diminish. If then we have $a+b$ where we imagine both quantities were what we took them to be; but if it should turn out that b is of the contrary kind, we know that we should have had $a-b$. If we put $+b$ for the quantity we thought we were using, and $-b$ for its opposite, the ordinary rule of signs will be sufficient to make the conversions which the correction of the mistake requires. Thus if, attending only to the rule that like signs produce $+$ and unlike signs $-$, we treat

$$a+(+b) \quad \text{and} \quad a+(-b)$$

we find

$$a+b \quad \text{and} \quad a-b;$$

or, in this instance, the affixing of $+$ or $-$ to a quantity according as our initial supposition is correct or incorrect, leaves us with our result if we were correct, and makes the necessary alteration if we were incorrect. The application of the same reasoning leads to the same conclusion in all the cases of addition and subtraction. Observe also that if any one, disputing the propriety of making the signs $+$ and $-$ take a new meaning, should prefer, say, to denote direct quantity by the prefix of ¶, and inverse quantity by that of §, the rule he would arrive at by induction is that like signs produce $+$ for operation, and ¶ for interpretation, while unlike signs produce $-$ for operation and § for interpretation; where by like signs he would find he must mean $+$ and $+$, or $+$ and ¶, $-$ and $-$, or $-$ and §, and all others unlike. His final rule then would be, use ¶ as if it were $+$, and § as if it were $-$, so that he would ultimately differ from the algebraist by the continual use of two new signs without any new uses or practical meanings.

In the operations of multiplication and division the rule of signs is thus shown:—It is said that two negative quantities multiplied together produce a positive quantity, which means that a mistake of direct for inverse, or *vice versâ*, made in both the terms of a product, produces no mistake in the product, when the latter is formed by the usual rules. Thus, if a, which should be $x-y$, has been taken to be $y-x$, and if b, which should be $v-w$, has been taken to be $w-v$, the algebraical product

$$(w-v)(y-x) \quad \text{or} \quad wy-wx-vy+vx$$

at which we arrive in the mistaken process, is precisely the same as

$$(v-w)(x-y) \quad \text{or} \quad vx-vy-wx+wy$$

at which we should have arrived in the correct process.

The first step then from arithmetic to algebra is made by the following definitions:—

1. Quantities are distinguished into positive and negative, which are to be considered as of diametrically opposite kinds; and common arithmetical quantities (abstract numbers without signs) are to be considered as positive. 2. The rules of arithmetical algebra are to be applied to the extended algebra, and in all cases in which the latter presents a case unknown to the former, the rule of signs already known in the former must be applied. The purely verbal question of the terms *less than nothing*, &c., will be considered under the word NOTHING.

The preceding extension gives an extended meaning to all the terms of operation; thus addition is no longer the simple arithmetical process, but a compound operation, first reducing a multiplicity of signs to one alone, and then following the direction of that sign; and the same of subtraction. Thus $a-(-b)$ is $a+b$. It may be asked then how we are to trace our steps through any problem so as to form its equation out of symbols which seem to have various meanings; for it might appear as if the $+$ of algebra were either the $+$ or $-$ of arithmetic, as the case may be. The answer is very simple: since the extended algebra is no more than arithmetic in its actual operations, however the meaning of those operations may be extended, we may be sure that if we assign a particular case of a problem, and treat it entirely as in arithmetic, we are, though with one case only in view, performing upon limited symbols (limited because we think at the time only of a limited meaning) the same steps which we should have to follow if we could, by one act of the mind, grasp the symbols in their utmost generality.

Our limits will not allow us to pursue this subject to the extent which might be necessary for an unpractised user of symbols, and we therefore pass on to the yet higher view of the question, in which the introduction is made to a purely symbolical algebra. If we examine any symbolical identity (the sign of identity being $=$) for example, so simple a one as

$$a+b=b+a$$

we see of course that its truth is a consequence of the definition of $+$ and of the conceptions which are inseparable in our minds from the addition of quantity to quantity. The truth of the identity, then, follows from the meaning of the symbols, but the converse is not true; the meaning of the symbols does not follow from the truth of the identity. That is, let it be granted that $a+b=b+a$, and it does not follow that $+$ means addition, for consistently with the preceding it might mean multiplication, or it might mean the formation of a rectangle by erecting a line equal to the second

symbol upon a line equal to the first. In fact, the identity before us merely expresses that + is a symbol of an operation so connected with two subjects of operation that the latter may be interchanged without any alteration of the result. And the same may be said of any other fundamental symbol of identity; it may preserve its truth under many different meanings.

Next, when we perform operations of algebra with that mechanical expertness which practice teaches, we do not look back to the meaning of our operations at each step, but proceed upon a few rules of operation, of the meaning of which we must become conscious the moment we have to stop and contrive the mode of proceeding, dropping that consciousness as soon as we are again in the routine of operation. If we collect the symbols of algebra, we shall find them all in the following list. 1. The numerical symbols of arithmetic. 2. Letters denoting magnitudes. 3. The signs of addition, subtraction, multiplication, and division, the latter with their usual abbreviations of $a \times b$ into ab, and $a \div b$ into $\frac{a}{b}$. 4. The exponent, as in a^b, b being any algebraical magnitude. 5. The symbols of logarithms, sines, cosines, &c., which may be considered but as abbreviations of series composed of terms made up of and connected by the preceding symbols. The list of fundamental operations is not very large: such as

$$+(+a)=+a, \quad ab+ac=a(b+c), \quad \frac{ma}{mb}=\frac{a}{b}, \text{ \&c.;}$$

so that it would be perfectly possible to imagine a person who had forgotten the meaning of the symbols able to perform the mere operations by reference to a few primary rules.

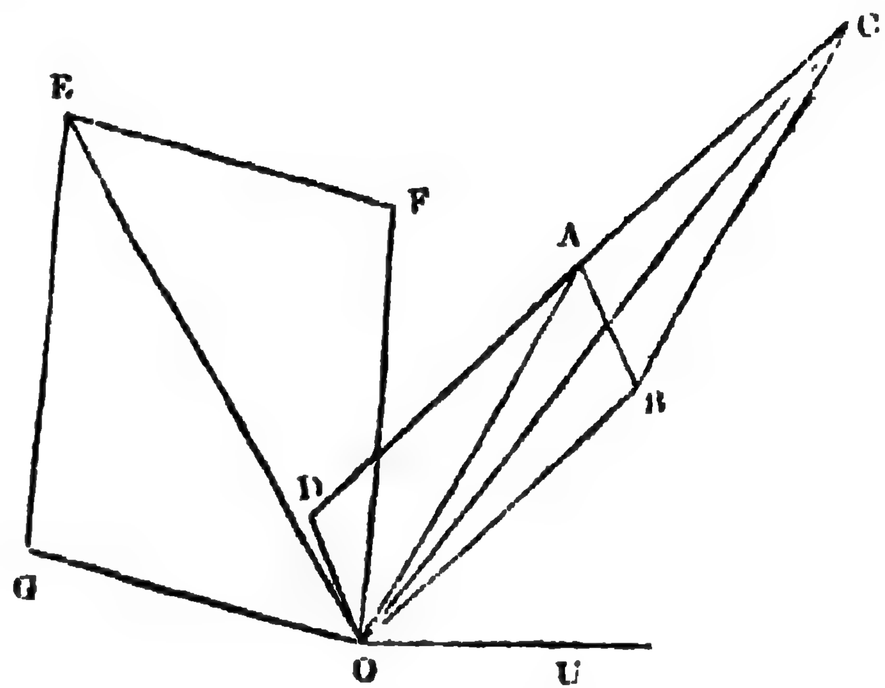
This being the case, suppose these few rules of reference collected together; we can then conceive a person operating by means of these rules, without thinking of their meaning. As it is of importance that a clear idea should be formed of this separation of symbolic from arithmetical reasoning, we shall propose the following illustration. A person who has thoroughly studied the algebra of positive and negative quantities, is attacked by a severe illness, on recovering from which he finds all memory of connection between his conceptions and the symbols which represented them totally gone, while his expertness in performing the mere transformations with which algebra abounds remains undiminished. When he sees $(a+b)^2$ he perfectly remembers that its substitute was $a^2+2ab+b^2$, but what a, b, +, &c. stood for, or might have been supposed to stand for, he has wholly forgotten.

He is now a purely symbolical algebraist. Suppose that he endeavours to recover the meaning of his symbols by close examination of their relations. He remembers, for example, that $a+b$ had such a meaning as made it identical with $b+a$, and he tries all meanings which will fulfil this condition, and attempts to give conformable meanings to other symbols, in the hope of picking out a set of definitions which shall be consistent with each other, and of which the relations which live in his memory shall be logical consequences. He succeeds in his attempt, and thus gives meaning to his transformations, and converts his symbolical algebra into a deduction from some fundamental notions of magnitude which he has slowly recovered. Perhaps the reader will say, he must then have discovered or remembered that a, b, c, &c. stand for numbers, that + and − mean addition and subtraction, &c. &c. By no means; the tenor of this article will require us to show another set of meanings on which he may have happened to alight, not only as consistent with each other as the arithmetical meanings, but more consistent; and in the article OPERATION we shall have to show still further the pliability of the algebraical system, by pointing out that the number of different interpretations under which its symbolical relations will represent truths, is absolutely unlimited. The basis of the algebra which our supposed recoverer of meanings might construct, is geometry, as arithmetic was that of the one which we imagine him to have forgotten: and its definitions are as follows. A plane is chosen and a point in it, and a line of a definite length, which may be called the *unit-line*, is drawn at pleasure from the point, in any direction in the plane. All letters denote lines drawn from the origin, either in the direction of the unit-line, or at any angle, angles being always measured in one given direction of revolution. An equation, $a=b$, means that the line a actually coincides with b, or is of the same length, and drawn in the same direction. The sign $a+b$ means the diagonal of the parallelogram whose sides are a and b: this becomes the sum when a and b are in the same direction. The sign $a-b$ means the remaining side of a parallelogram in which a is a diagonal and b one side. Again, ab means a fourth proportional to the unit-line, a, and b, directed so as to make an angle with the unit-line equal to the sum of the angles made by a and b with the unit-line; and $\frac{a}{b}$ is a fourth proportional to b, the unit-line, and a, placed so as to make an angle with the unit-line equal to the excess of the angle of a over the angle of b, in the usual direction of measurement (if the angle of a be the greater), or to the excess of the second over the first, in the *contrary* direction (if the second be the greater). All the other definitions follow as in common algebra; thus aa is abbreviated into a^2, and $\sqrt{a}$ means such a line that $\sqrt{a}.\sqrt{a}=a$. The numbers of arithmetic stand for lines measured on the unit line.

Grant such a change of definitions, and every formula which expressed a truth in the old algebra, expresses another and a very different truth in the new one. We shall now point out how to show (by construction) the truth of the old formula

$$(a+b)(a-b)=aa-bb,$$

supposing the terms to have their new meanings.



OU is the length and direction of the unit-line, and OA and OB those of the lines a and b. Hence OC is what is called $a+b$, and OD is $a-b$, since it is the other side of a parallelogram which has a for diagonal and b for one side. Again, take OE, a fourth proportional to OU, OA, and OA, with the angle UOE double of UOA, and we have what is called aa. Similarly OF is bb; whence OG is $aa-bb$, the other side of a parallelogram which has aa for diagonal and bb for one side. And it will be found on measurement that OG is also a fourth proportional to OU, OC, and OD, inclined at an angle which is the sum of the angles UOC and UOD: whence it is $(a+b)(a-b)$.

To show the truth of symbolical algebra, when the terms have the above-described meanings, would require a small treatise: we shall presently give references to works on the subject. We shall now recapitulate the conclusions at which we have arrived.

1. The conclusions of algebra may be made logical consequences of a few simple relations, without reference to the meaning of the symbols used: all algebra is true when these relations are true, so that all algebra is true under any meaning of the symbols which will allow of the truth of these relations.

2. It is not true that there is only one set of meanings under which the fundamental relations of algebra are truths, for three sets have been already alluded to in this article, namely, the common and limited arithmetical meanings, the extensions under which the difficulties of the negative sign disappear, and the geometrical meanings last described.

3. The order of discovery is as follows:—We first ask what sort of magnitude is to be reasoned upon; next, what are the obvious relations existing between such magnitudes; lastly, what is a convenient mode of representing the magnitudes in question; all that follows is an application of the logic common to all branches of reasoning. But when we wish to give the idea of symbolical algebra, we invert the order of the preceding questions; and we ask, firstly, what

symbols shall be used (without any reference to meaning); next, what shall be the laws under which such symbols are to be operated upon; the deduction of all subsequent consequences is again an application of common logic. Lastly, we explain the meanings which must be attached to the symbols, in order that they may have prototypes of which the assigned laws of operation are true.

We have two remarks to make before proceeding to the consideration of what are called, in common algebra, impossible quantities.

First, we have talked hitherto of change of meaning in symbols, as if we really passed from one to another and a totally different and even contrary meaning, keeping the same symbol to express both. The word *change* is too general; it is that particular change called *extension* which is employed, at least throughout this article. The meaning of a term is said to be changed by *extension*, or extended, when the new meaning contains all the old, and more; or when all cases which fall under the old meaning fall under the new one also. Thus in the preceding geometrical definition, the new meaning of $a + b$ (the diagonal whose sides are a and b) contains the old one (or simple addition); for if the two sides of a parallelogram be made to coincide, one diagonal becomes the sum of these sides. If then we call the last-mentioned set of definitions the new algebra, it may be made to appear that the old algebra is all that part of the new which treats of lines making no angle with one another. We shall presently see further illustration of it.

Secondly, we have noted the two extreme cases, in one of which we begin with the meanings of all symbols fixed, and in the other of which we have no specific meanings attached to any symbol, but wait for the time when it may be convenient to investigate sufficient meaning for all. But between these two comes the possible case of having found it advisable to affix meanings to some symbols of operation, leaving others only defined by the symbolic relations which dictate the manner of operating, and not further defined in meaning. Thus from the enumeration above given of the definitions of a geometrical algebra, it will be clear that a^{10} means the eleventh geometrical proportional to the unit and a, inclined to the unit-line at 10 times the angle of a. But it would be impossible from that enumeration to decide at once on all the cases of a^b, for instance, where $b = \sqrt{(-1)}$. In such a case, namely, where the meaning of a symbol is left undetermined, we must wait until we can investigate the question whether such meaning is possible to be given, consistently with the meanings attached to the previous symbols. This process is called Interpretation, and in the article cited will be found an instance which occurs in common algebra. If such meaning cannot be given, then the symbol is properly *impossible*; if it can be given in more ways than one, it is usually called *ambiguous*.

We now drop what we have gathered on symbolical algebra, and take up the science at the point at which such extensions were made as abolished the difficulty of the simple negative quantity. It is then obvious that a^2, or $+a^2$, is both $+a \times +a$ and $-a \times -a$, so that every positive number has two square roots of equal numerical value, one positive and the other negative. But it immediately follows that a negative quantity has no square root, at least none within the range of quantity, as defined, for the squares of positive and of negative quantities are equally positive. Consequently such a symbol as $\sqrt{(-1)}$ is (with reference to this algebra) impossible, just as $7-10$ is impossible in simple arithmetic. This observation is as old as algebra: the 'Viga Ganita' says, 'there is no square root of a negative quantity, for it is not a square.'

The impossible quantity however, like the negative one, was admitted among the objects of algebra. Bombelli showed that the case in which the root of a cubic equation is a complicated function of impossible quantities, is precisely that in which all the roots are real and possible: Wallis and others attempted the explanation of impossible roots, but with no success; they continued to be used as algebraical symbols, and a large number of verified cases led to the following result. Whenever an algebraical operation, beginning with a symbolical truth, leads to a result in which no impossible quantities appear, that result will be not the less numerically true because the reasoning contained rules of operation on quantity applied to symbols which represent no quantities. This law stood upon the same sort of evidence as a physical law of nature; it was constantly found to prevail. It had also analogy in its favour, for precisely the same law had been observed as to negative quantities, though the explanation of the latter was obtained too soon to need the aid of induction in their case.

We will suppose ourselves using these impossible (or imaginary) quantities, not with a view to establish results, but to examine the consequences of applying to them precisely the rules which have been shown to apply to quantities. The following is perhaps the shortest synthetical mode of treating the subject.

If, by rules, we multiply together $\cos x+k \sin x$, and $\cos y+k \sin y$, k being merely an abbreviation of $\sqrt{(-1)}$, so that $k^2=-1$, $k^3=-\sqrt{(-1)}$, $k^4=1$, &c., we find as the result,

$$\cos (x+y) + k \sin (x+y)$$

if then $\phi x=\cos x+k \sin x$, we have

$$\phi (x+y) = \phi x \times \phi y;$$

from which relation, as shown at length in Binomial Theorem, it follows that

$$\cos x+k \sin x=\mathrm{K}^x$$

where K is a constant independent of x. From this it follows that

$$\cos nx+k \sin nx=(\cos x+k \sin x)^n$$

which is called *De Moivre's Theorem*. It is true for all values of n. Let $nx=\theta$, which gives

$$\cos \theta+k \sin \theta=\left(\cos\frac{\theta}{n}+k \sin\frac{\theta}{n}\right)^n$$

where $\theta : n=x$. The second side may take the form

$$(\cos x)^n (1+k \tan x)^n \text{ or } (1-2 \sin^2 \tfrac{1}{2}x)^n (1+k \tan x)^n.$$

Let $\sin \frac{1}{2}x : \frac{1}{2}x=p$, and $\tan x : x=q$, then it is known that both p and q have the limit unity when x is diminished without limit. The preceding is the product of $(1-\frac{1}{2}p^2 x^2)^n$ and $(1+kqx)^n$: let these formulæ be developed by the binomial theorem, and they become (writing $\theta : n$ for x)

$$1-\tfrac{1}{2}p^2\frac{\theta^2}{n}+(\tfrac{1}{2}p^2)^2\frac{\theta^4}{n^3}\,\frac{n-1}{2}-\ldots.$$

$$1+kq\theta+k^2q^2\theta^2\,\frac{n-1}{2n}+k^3q^3\theta^3\,\frac{n-1}{2n}\cdot\frac{n-2}{3n}+\ldots.$$

If we now suppose n to increase without limit, x diminishing without limit so that nx remains $=\theta$, p and q approaching without limit to unity, we have unity as the limit of the first series, and

$$1+k\theta+\frac{k^2\theta^2}{2}+\frac{k^3\theta^3}{2.3}+\ldots. \text{ or } \varepsilon^{k\theta}$$

as that of the second, ε being the base of Napier's logarithms. [Logarithms.] Consequently

$$\cos \theta+k \sin \theta=\varepsilon^{k\theta}, \cos \theta-k \sin \theta=\varepsilon^{-k\theta}$$

the second of which is obtained from the first (which is true for all values of θ) by writing $-\theta$ instead of θ. From these, by addition and subtraction, the well-known *exponential* expressions for the sine and cosine are deduced, namely,

$$\cos \theta=\frac{\varepsilon^{k\theta}+\varepsilon^{-k\theta}}{2}, \sin \theta=\frac{\varepsilon^{k\theta}-\varepsilon^{-k\theta}}{2k}$$

expressions which, however widely used, never fail to give true results, in all cases in which they give results containing only even powers of k, or real algebraical quantities.

We shall give a glance at some of the symbolical consequences of the preceding, previously to entering upon their rational explanation.

1. The representation of impossible quantities. It might be supposed that such a symbol as k or $\sqrt{(-1)}$ would lead to a number of other symbols, just as -1 led to $\sqrt{(-1)}$. Such however is not the case, and it can be easily shown that any algebraical expression, however complicated, which is a function of $\sqrt{(-1)}$, can be reduced to the form $\mathrm{A}+\mathrm{B}\sqrt{(-1)}$, where A and B are possible quantities. For instance (k being $\sqrt{(-1)}$)

$$(a+bk)^{m+nk}=\varepsilon^{\mathrm{A}} \cos \mathrm{B}+k.\varepsilon^{\mathrm{A}}.\sin \mathrm{B}$$

where A and B are determined as follows. Let

$$r=\sqrt{(a^2+b^2)}, \tan \theta=\frac{b}{a},$$

$$\mathrm{A}=m \log r-n\theta, \quad \mathrm{B}=n \log r+m\theta.$$

If we take a simple quantity, $y=a+bk$, then if $\tan\theta=b:a$, $r=\sqrt{(b^2+a^2)}$, we have

$$y=r\,(\cos\theta+k\sin\theta)=r\epsilon^{k\theta}.$$

2. The extension of the theory of logarithms. The whole revolution, or four right angles, being 2π [ANGLE], we have $\cos 2m\pi=1$, $\sin 2m\pi=0$, where m is any whole number, positive or negative. Consequently

$$\epsilon^{2m\pi.k}=\cos 2m\pi+k\sin 2m\pi=1$$

for all such values of m. If then x be the common algebraical logarithm of y, positive or negative, we have

$$y=\epsilon^x,\ y\times 1=\epsilon^x\times\epsilon^{2m\pi.k}\ \text{or}\ y=\epsilon^{x+2m\pi.k}$$

so that according to the definition of a logarithm, the moment we admit impossible quantities, and in what sense soever we explain them, from that moment and in that sense we must say that x being the usual or *real* logarithm of y, it has an infinite number of other logarithms contained in the formula $x+2m\pi.k$. In the same manner, using $(2m+1)\,\pi$ where m is a whole number (+ or −) we find that $-y$, which, when we talk of real quantities, has no logarithm, has now an infinite number, included in the form $x+(2m+1)\pi.k$.

3. The complete extraction of the roots of any quantity. We know that 1 has two square roots, three cube roots, and four fourth roots, since we can find them by common algebra. Now since unity can be represented in an infinite number of different ways, in the formula $\epsilon^{2m\pi.k}$, and since the nth root of this formula is

$$\epsilon^{\frac{2m\pi.k}{n}}\quad\text{or}\ \cos\frac{2m\pi}{n}+k\sin\frac{2m\pi}{n},$$

we might at first suppose that there is an infinite number of these roots, made by giving different whole values to m. On examining them however it is found that they occur in parcels, each containing n distinct roots, and each parcel being a repetition of the preceding one. [ROOT.]

4. The complete conversion of trigonometry into a branch of algebra. We see that we have given symbolic expressions for the sine and cosine of any angle, which would, were such a thing necessary, enable us to dispense with separate symbols for these functions.

5. Ready means of calculation, by means of the trigonometical tables, in cases where ordinary means fail. For instance, in what is called the IRREDUCIBLE CASE of cubic equations, Cardan's formula gives the root in the form

$$\sqrt[3]{(a+b\sqrt{(-1)})}+\sqrt[3]{(a-b\sqrt{(-1)})}.$$

If we assume $a=r\cos\theta$, $b=r\sin\theta$, or $r=\sqrt{(b^2+a^2)}$, $\tan\theta=\frac{b}{a}$, the preceding becomes (making $k=\sqrt{(-1)}$)

$$\sqrt[3]{r}.\left\{\cos\theta+k\sin\theta\right\}^{\frac{1}{3}}+\sqrt[3]{r}\left\{\cos\theta-k\sin\theta\right\}^{\frac{1}{3}}$$

$$\text{or}\ \sqrt[3]{r}.\left\{\cos\tfrac{1}{3}\theta+k\sin\tfrac{1}{3}\theta\right\}+\sqrt[3]{r}\left\{\cos\tfrac{1}{3}\theta-k\sin\tfrac{1}{3}\theta\right\}$$

which is $2\sqrt[3]{r}.\cos\frac{1}{3}\theta$; and since the original suppositions will not be altered by writing $\theta+2\pi$ and $\theta+4\pi$ instead of θ, the results of these latter suppositions are equally values of the expression under calculation: so that its three values are

$$2\sqrt[3]{r}.\cos\frac{\theta}{3},\qquad 2\sqrt[3]{r}.\cos\frac{\theta+2\pi}{3},\qquad 2\sqrt[3]{r}.\cos\frac{\theta+4\pi}{3}.$$

These three are distinct: but $\theta+6\pi$ (which might equally be written for θ) would give

$$2\sqrt[3]{r}.\cos\frac{\theta+6\pi}{3}\ \text{or}\ 2\sqrt[3]{r}.\cos\frac{\theta}{3}$$

a repetition of the first. This amounts to the discovery made by BOMBELLI.

We now come to the explanation of these quantities. Since we have used no rules except those which apply to real positive and negative quantities, it follows that if we had merely laid down the symbolical foundations of algebra, without reference to the meaning of symbols, the symbol $\sqrt{(-1)}$ and formulæ in which it occurs would have been logical consequences of the relations permitted at the outset, as much as those in which no such sign occurs. It is only when we come to attach meaning to signs, that we can say whether any result is real or not: and a result which is real under the extended meanings may be incongruous and self-contradictory under the limited meanings. Such was the case with the negative quantity, which is no less impossible than its square, considered with reference to strict arithmetical definitions. The preceding results, then, are rationally true, whenever such a signification is given to the symbols as will, first, satisfy the fundamental relations, secondly, give rational meaning to $\sqrt{(-1)}$. Ordinary algebraical definitions only fulfil the first of those conditions.

We shall now turn to the fundamental definitions of what we have called the geometrical algebra: this name is given because it is only in geometry that a subject matter has yet been found, our conceptions of which are wide enough to give meaning to all the symbols which result from the primitive rules. In most of the objects of calculation we can only conceive two states, which we call *diametrically* opposite; and this geometrical word enters here, precisely because in geometry there are other states of opposition, of a weaker character, so that when we wish to express the most decided opposition, we turn to that sort of magnitude in which a less degree can be conceived. Thus we have no word drawn from the relation of loss and gain to express complete opposition; nor could we have, since there is nothing less complete with which to compare it: between absolute loss and absolute gain there are no gradations. Thus property, debt, or neither, before, after, or now, may be compared with ascent, descent, or neither; but though we can, for instance, imagine time after to be represented by a line drawn north, and time before by another drawn southward, our power of comparison ends here; it would be impossible to give necessary or even obviously convenient meaning to a line drawn east. But in geometry there are an infinite number of directions, no one of which is north or south, all being intermediate. Again, a gradual passage from one state to its opposite can generally only be attained by a passage through the intermediate state in which magnitude vanishes: for instance, a gradual loss of property followed by a gradual increase of debt requires that at one moment there should be neither property nor debt. But in geometry, a line can attain the direct opposite of its first position without changing its magnitude, by revolution round one of its extremities. These preliminary observations will prevent its being matter of surprise if geometry should be found to admit a wider use of symbols, consistently with rational interpretation, than arithmetic or the algebra derived from it.

We have explained the meaning of $a+b$, $a-b$, ab, and $a:b$, from which it follows that we know how to construct aa, aaa, &c., which we may abbreviate into a^2, a^3, &c. And we are here in the position just now pointed out, namely, that some of the ordinary symbols of algebra have received meaning, whereas others are yet without it; for instance, a^{-n}, $a^{\frac{m}{n}}$, $a^{\sqrt{(-1)}}$, &c. And since our object is to detect meanings which shall make the symbolic relations of algebra true, we must always interpret exponents so that their meanings may make the following relations exist:

$$a^m\cdot a^n=a^{m+n},\qquad (a^m)^n=a^{mn}$$

We shall now proceed with the interpretation of symbols.

1. The symbol $-a$ must stand for a line of length equal, and direction opposite, to that of $+a$; for $0-a$ means the other side of a parallelogram of which the diagonal disappears, one side being a.

2. a^{-n} must represent $1:a^n$, and a^0 must always represent the unit line; for a^0 must be such that $a^m a^0=a^{m+0}=a^m$; that is, a fourth proportional to 1, a^0, and a^m, is a^m; whence a^0 must be 1 as to length. In direction $a^m a^0$ is the same as that of a^m; whence the sum of the angles of a^m and a^0 is that of a^m, or the angle of a^0 is nothing. Again, a^{-n} must be so explained that $a^n a^{-n}$, and a^{n-n} or a^0, may be the same; whence $a^n a^{-n}=1$.

3. $a^{m:n}$ must be so explained that $a^{(m:n)^n}=a^m$; whence it means the first of $n-1$ mean proportionals between 1 and a^m, inclined at an angle which is the nth part of the angle of a^m.

But it is necessary to notice that any angle θ is, considered as pointing out a direction, the same thing as $2\pi+\theta$, or $\theta-2\pi$, or $\theta\pm 2m\pi$, m being a whole number That is to

say, a line which sets out from the unit line may be conceived to have attained the position denoted by an angle θ, either by moving simply through θ, or by afterwards making any number of complete revolutions in either direction. So long as we multiply angles by a whole number, this makes no ambiguity; for instance, if a have the angle θ, or $\theta + 2\pi$, &c., a^4 has the angle 4θ, $4\theta + 8\pi$, &c., all of which indicate the same direction. But if we wish to find $a^{1:4}$ or to take the first of three mean proportionals between 1 and a, inclined at the fourth part of the angle of a, then the fourth parts of the angles

$$\ldots \theta - 8\pi, \quad \theta - 6\pi, \quad \theta - 4\pi, \quad \theta - 2\pi, \quad \theta, \quad \theta + 2\pi,$$
$$\theta + 4\pi, \quad \theta + 6\pi, \quad \theta + 8\pi, \ldots$$

are severally

$$\frac{\theta}{4} - 2\pi, \quad \frac{\theta}{4} - \frac{3\pi}{2}, \quad \frac{\theta}{4} - \pi, \quad \frac{\theta}{4} - \frac{\pi}{2}, \quad \frac{\theta}{4}, \quad \frac{\theta}{4} + \frac{\pi}{2},$$
$$\frac{\theta}{4} + \pi, \quad \frac{\theta}{4} + \frac{3\pi}{2}, \quad \frac{\theta}{4} + 2\pi, \ldots.$$

giving a succession of directions, each of which differs from the preceding, not by four right angles, but by one right angle. There are then four distinct meanings of this symbol $a^{1:4}$.

5. The symbol $\surd(-1)$ stands for a line equal in length to the unit line, and inclined to it at a right angle; for 1 and -1 make two right angles with each other, whence $(-1)^{1:2}$ is the mean proportional between 1 and 1 (or 1 itself) inclined at half that angle, or at a right angle. Similarly $-\surd(-1)$ is in the opposite direction, and makes three right angles with the unit line. Also $a\surd(-1)$ is a line in length equal to a, but making an angle with the unit line larger by a right angle than the angle of a.

6. Any line may now receive a simple representation; for the line a, inclined at the angle θ to the unit line, is the diagonal of a rectangle, of which the side in the direction of the unit line is $a \cos \theta$, and that perpendicular to the unit line is in length $a \sin \theta$, so that its symbolical representation is $\surd(-1).a \sin \theta$. Hence the line a, inclined at the angle θ, is

$$a(\cos\theta + \surd(-1).\sin\theta).$$

Hence we see the meaning of the symbol $a.\varepsilon^{\theta\surd(-1)}$; for since the definitions satisfy all the fundamental relations of algebra, the theorem

$$\varepsilon^{\theta\surd(-1)} = \cos\theta + \surd(-1)\sin\theta,$$

which is a necessary consequence of these relations, requires us so to define the first side as to establish its identity of meaning with the second. Consequently, $\varepsilon^{k\theta}$, k being $\surd(-1)$, must represent a line equal in length to the unit line, inclined at an angle θ.

To enter further into the details of this extension of algebra would require too great a length: we shall now proceed to some remarks upon it.

If any one should object that it is founded on geometry, we answer that it is not so much founded on geometry as applied to it. The symbolical algebra, which we draw in the first instance from arithmetical suggestions, and afterwards cut loose, so to speak, from that science, founding it upon purely symbolical definitions, is applied to geometry, because in the latter science, and in the latter only, do we find notions of magnitude, the different affections of which are sufficient to supply rational meaning to all its symbols. Let any one produce other ideas of magnitude, of loss and gain for instance, as varied in their different affections, and the general truths of symbolical algebra will find a new application.

The subject-matter of the preceding algebra is geometry of only two dimensions; whereas it might be supposed that the application would never be complete until it embraced geometry of three dimensions. No such extension has however yet been made; though it is not unreasonable to suppose that it may be made at some future time.

But perhaps it may be said that this new algebra, being based upon its own definitions, however logically its conclusions may follow from those definitions, can afford no aid to the common algebra in explaining those quantities which are as impossible in the latter as they are possible in the former. What does it profit us, troubled as we are with symbols which upon our own definitions we cannot rationally explain, to know that those same arbitrary marks, being made to have other meanings, would not present the same difficulties? It may almost seem as if we should relieve ourselves from the trouble of investigating the error of a process which ends in $2 + 2 = 5$, by remembering that those who should mean by 5 what we mean by 4 would not see any necessity for revising the operations. The difficulty thus broadly stated must be felt more or less by every one before he can entirely make up his mind, if not to the reception, at least to the proposed application of symbolical algebra. The answer is as follows:—

In the common operations of algebra we do not set particular value upon any symbols or meanings, except in so far as they answer our purpose. If that purpose be the discipline of the mind, there is no point at which a greater enlargement of its power takes place than must happen when it begins to comprehend that any set of definitions may be such as to require restriction upon operations; so that the alternative is, the enlargement of the definitions to an extent which will allow of every result of operation being rationally explained. If it be one of the errors to which our bounded faculties are liable, that we may invent the processes and mechanism of a genus upon the definitions incidental to the consideration of a species, or anything of that kind, we have made a discovery, when we find our error, which is well worth the trouble, even leaving out of consideration the expansion of views which is obtained by the investigation of the correction. But if the purpose be the investigation of a formula for practical use, whether in physics or any other branch of application, nothing can be more indifferent than the manner in which our result is obtained, provided only we are sure of its truth.

When we reason upon the principles of the old algebra, we are sufficiently sure of the truth of our results, partly by actual verification, partly by those imperfect views of the nature of symbolical algebra which preceded the new science. But it was not always possible to arrive at the highest degree of mathematical assurance, for even in cases where a result could be obtained free from impossible quantities, the intermediate steps could not always be fully comprehended; and their verification, if required, was sometimes (though not often) imperfect: and in every case, it must be remembered, no result was fit for actual application until the impossible quantities had disappeared.

Let us say that we are now considering such a case, namely, one in which quantities impossible in ordinary algebra have been used in the process, though they disappear in the result. The consequence is that if the extended definitions were employed, the answer represents a line drawn in the direction of the unit line if positive, or in the contrary direction if negative; and the same of the symbols of which the answer is a function. But for lines measured in that unit line the extended definitions coincide with the ordinary ones, as has been noticed. So that, as far as the result is concerned, we are sure of the same answer (when there is an answer that we call possible), whether we employ one or the other set of definitions; with the advantage of being able, in employing the new definitions, to put a rational interpretation upon every step of the process.

But has the new algebra no impossible quantities peculiar to itself? We cannot tell, for all time to come, what the answer to this question shall be; at present we can reply that though there are symbols which would indicate previous misconception if they appeared in a result, yet there are none which do not admit of interpretation. For instance, we see that angles in our definitions may be positive or negative (measured on one side or the other of the unit line), but we have no *angle* which $\surd(-1)$ can represent. If then, in the most extended algebra, the answer to the question, 'At what angle must a line assumed $= h$ be inclined to satisfy such and such conditions?' were, 'The angle must be $a + b\surd(-1)$,' we should at first say that the question was impossible. But if we examine further, we see that a line h applied at an angle $a + b\surd(-1)$ is represented by

$$h\,\varepsilon^{(a+b\surd(-1))\surd(-1)} \text{ which is } h\,\varepsilon^{-b}\,\varepsilon^{a\surd(-1)}$$

when treated by symbolical rules. We should conclude then that we have made some error by which h was determined in a manner which cannot satisfy the conditions, but that a line equal in length to $h\,\varepsilon^{-b}$, inclined at an angle a, will satisfy them. This last answer must at least be examined, before it is asserted that the question is impossible. The following formulæ, if they occur, may be interpreted by

the identical expressions given in the second sides ($k = \surd(-1)$)

$$\cos(a + bk) = \cos a \frac{\varepsilon^b + \varepsilon^{-b}}{2} - \sin a . \frac{\varepsilon^b - \varepsilon^{-b}}{2} . k$$

$$\sin(a + bk) = \sin a \frac{\varepsilon^b + \varepsilon^{-b}}{2} + \cos a \frac{\varepsilon^b - \varepsilon^{-b}}{2} . k$$

The whole of the ambiguous cases of algebra depend upon this, that any quantity x can also be represented by $x . \varepsilon^{ak}$, where a represents any whole number of revolutions. As long as only multiples of a occur, different appearances of form present themselves, not indicating real alteration either of length or direction; but when submultiples of a occur, an alteration of direction takes place, unless such submultiple be also an exact number of revolutions.

The logarithmic theory of the most extended algebra merits a particular notice. It is remarkable that the first hint of it was given by a purely symbolical investigation, conducted entirely with reference to the common algebraical definitions. Some years ago Mr. Graves* asserted that the logarithms of unity, in the most general sense of the term, should be contained in the formula

$$\frac{2\pi m\sqrt{-1}}{1 + 2\pi n\sqrt{-1}}, \quad \text{instead of } 2\pi m\sqrt{-1};$$

m and n being any whole numbers.

If we define a logarithm by the symbolic relation $a^{\log x} = x$, where a is an arbitrary base, and if, for well-known reasons of a purely numerical character, we assume ε to be the length of the base, we may ask what is the logarithm of a unit inclined at the angle θ, the base being ε inclined at an angle ϕ. The answer must be such a value of x as will satisfy

$$\left(\varepsilon . \varepsilon^{\phi k}\right)^x = \varepsilon^{\theta k}, \quad \text{or} \quad x = \frac{\theta . k}{1 + \phi\ k}$$

in which if, as we may do, we increase or diminish either ϕ or θ by a whole number of revolutions, we find, as in other cases, that a line which has attained a certain position by one number of revolutions, distinguishes itself, always in form, and sometimes in results, from the same line in the same position, attained by another number of revolutions. If our unit be in the unit line after m revolutions, and the base be also in the unit line after n revolutions, the logarithm of such a unit to such a base is what was given as the logarithm of unity by Mr. Graves. Nor is the preceding process impossible: for it shows a set of real operations by which ε, inclined at an angle ϕ, might be converted into a unit inclined at an angle θ. If we ask whether the fundamental properties of logarithms remain true, we shall find that the logarithm of a unit added to the logarithm of a unit differently inclined, and with a differently inclined base, is still the logarithm of a unit, in which both the angles have received another alteration. If the logarithms of two units inclined at angles θ and θ', to bases inclined at ϕ and ϕ', be added together, the result is the logarithm of a unit inclined at an angle

$$\theta + \theta' - \frac{\theta\theta\ (\phi' - \phi)^2}{\theta(1 + \phi'^2) + \theta'(1 + \phi^2)}$$

to a base inclined at the angle

$$\frac{\phi\theta(1 + \phi'^2) + \phi'\theta'(1 + \phi^2)}{\theta(1 + \phi'^2) + \theta'(1 + \phi^2)}$$

But these conclusions do not hold when the logarithm of a is added to that of b, a and b not being units, and the bases being differently inclined: nor is it necessary here to state the extensions which the above formulæ must receive in such a case.

The following list contains all the recent works of which we can collect the titles, in which general algebra, or the difficulties which preceded its introduction, are considered to any extent:—Woodhouse, 'Phil. Trans.,' 1802; Woodhouse, 'Principles of Analytical Calculation,' 1803; Buée, 'Phil. Trans.,' 1806; Argand, 'Essai sur la Manière de représenter les Quantités Imaginaires,' Paris, 1806; various papers in the 'Annales de Mathématiques, for 1813, &c.; Gompertz, 'On the Principles and Application of Imaginary Quantities,' 1817 and 1818; Warren, 'On the Geometrical Representation of the Square Roots of Negative Quantities,' Cambridge, 1828 (the first systematic elementary work based on extended definitions); Peacock, 'Treatise on Algebra,' Cambridge, 1830 (the first work on symbolical algebra); Davies Gilbert, 'Phil. Trans.,' 1831, 'On the Nature of Negative and Impossible Quantities;' Peacock, 'Report on certain branches of Analysis, in the Report of the Third Meeting of the British Association,' London, 1834. (This work contains the modern history of the extensions, and an account of several of those above cited.) See also a Review of Professor Peacock's 'Algebra,' in the ninth volume of the 'Journal of Education;' and De Morgan's 'Trigonometry,' 1837. On the method of determining the signs of geometrical magnitudes, see the 'Differential Calculus,' in 'Library of Useful Knowledge,' chapter xiv.

We cannot omit to mention a paper by Sir William Hamilton, recently published in the 'Transactions of the Royal Irish Academy.' The author treats algebra as the science of time, not of magnitude; and as far as the explanation of positive and negative quantities are concerned, it is not difficult to follow him. The symbol $\surd(-1)$ however is of a harder character. M. Cauchy and others had previously considered it as merely a symbolical contrivance to express the coexistence of two equations; thus

$$a + b\surd(-1) = c + d\surd(-1)$$

is a well-known method of implying $a = c$ and $b = d$, both in one equation. The manner in which Sir William Hamilton has connected this symbol with his system would justify us in saying that, if his science of time were re-translated into a science of magnitude, his explanation of impossible quantities would fall back into the one just alluded to; and it is difficult to describe it more fully without entering further into the matter than we have room for. We are inclined to think that this explanation of algebra with reference to time may finally be admitted as one method of supplying the foundations of the purely symbolical science; but we must confess ourselves not yet sufficiently clear upon the manner in which the symbol $\surd(-1)$ is connected with its definition, to hazard a positive opinion.

* Now professor of jurisprudence in University College, London; in a paper published in the 'Phil. Trans.' for 1829. This extension, however simply it may follow from the extended definitions, excited some discussion and opposition when advanced in connection with the ordinary principles of algebra.

NEGRO. [MAN.]

NEGROPONT. [EUBŒA.]

NEGUNDO, a genus of trees, separated from Acer because of its pinnated leaves and diœcious apetalous flowers. Two species are known, one of which is a handsome hardy tree, inhabiting the United States of North America, and now common in the gardens of this country; the other is a native of Mexico, and at present but little known: it may be a mere variety of the other.

NEHEMIAH. [EZRA.]

NEISSE is a principality in Silesia, the larger portion of which, containing 480 square miles, with 110,000 inhabitants, belongs to Prussia; the remainder, which contains 320 square miles, with 56,000 inhabitants, belongs to Austria. The Prussian portion is very fertile, but the Austrian part is mountainous. Till 1820 the whole principality belonged to the bishop of Breslau, who now possesses only the Austrian portion, with the title of a duchy; the Prussian portion is converted into a royal principality, including the circles of Grottkau and Neisse, in the government of Oppeln.

NEISSE, the capital, in 51° 25′ N. lat. and 17° 20′ E. long., is situated in the Prussian portion, at the conflux of the rivers Neisse and Biele, in a marshy and unhealthy spot, 574 feet above the level of the sea. It is said to have been built in the year 966, but was not fortified till 1594, since which time it has undergone several sieges, and its works have been gradually strengthened and extended, so that it is now one of the most important fortresses in the Prussian dominions. In 1743 Frederick II. laid the first stone of Fort Preussen, on an eminence at the foot of which is the newly-built and strongly fortified suburb Friedrichsstadt, which extends to the Neisse. The fortress is surrounded by broad and deep moats, and the surrounding country can be laid under water in case of a siege. Neisse is a clean well-built town. The public buildings are, a splendid episcopal palace, six Roman Catholic churches, a Protestant church, a Catholic gymnasium, a town-hall, and a synagogue. There are numerous schools and charitable institutions. The gymnasium has very fine collections of various kinds; but the library of 10,000 volumes was destroyed in the siege in 1807. As the capital of the principality and the

circle, the town is the seat of the courts of justice and different public offices; and the inhabitants, who are about 11,000, gain their subsistence by breweries and manufactures of linen, woollen, ribands, and stockings, and a great trade in yarn. There are likewise a royal manufactory of arms and a powder-mill. In the environs there are quarries of excellent freestone, of which considerable quantities are exported.

NELEDINSKY-MELETZKY, YURII, the most eminent song-writer Russia has yet produced, was born in 1751, and served in the campaigns against the Turks, from the year 1770 to 1774, and, after the peace between the two countries, accompanied the Russian mission to Constantinople. Subsequently an office in the civil department was bestowed upon him by the emperor Paul, and in 1797-8 he accompanied that sovereign in his journey to Kazan and White Russia. This last mark of the imperial favour was followed by others of a more substantial nature, for an estate with several hundred peasants was shortly after allotted to him as the reward of his services, besides the order of St. Anne, to which that of St. Alexander Nevsky was added in 1809.

Though, considered singly, his songs and ballads may appear merely elegant poetical trifles, and indicate no very high literary effort or ambition, they prove him to have possessed a decided talent for that species of composition, and the power of infusing into it a gracefulness and charm for which the language afforded no previous models. To great simplicity they unite great tenderness and warmth of feeling. He died in 1829, at the age of 78.

NELLA MALA MOUNTAINS. [HINDUSTAN, vol. xii., p. 208.]

NELLIGREEN MOUNTAINS. [HINDUSTAN, vol. xii., p. 210.]

NELLORE, a district of the Carnatic province, lying between the 14th and 16th degrees of north latitude. It is bounded on the north by Guntore, on the east by the Bay of Bengal, on the south by the northern division of Arcot, and on the west by Cuddapah. The district is well watered by many streams, which rise in the Eastern Ghauts and fall into the Bay of Bengal. It is also traversed from west to east by the Pennar. The principal towns of the district are Nellore, Ongole, and Sarapilly.

The Ryotwary system prevails almost universally in Nellore, the cultivator paying the rent of the land directly into the hands of the government collector. The gross revenue received in 1817 amounted to 68,853*l.* As regards the numbers of the population, very different statements are given. According to returns made to the government of Madras in 1822, the total population was 439,467; while the number of inhabitants according to a statement laid before parliament in 1833 was 432,540 males and 406,927 females, together 839,467. There is evidently a great mistake in one of these statements; and it is probable, as the difference amounts to the number of 400,000 exactly, that the error has resulted from the accidental substitution of one figure for another in the returns of 1822; the larger number, being given with more circumstantiality, has the greater appearance of exactness.

Some copper-mines have been found in the district, but not under circumstances that admit of their being profitably worked. A considerable quantity of salt is made for account of the government on the coast near the town of Nellore.

The town of NELLORE is situated on the south bank of the Pennar river, in 14° 29′ N. lat. and 80° 3′ E. long. The town is surrounded by a mud wall, with some towers of stone at intervals. It is a populous place, and a considerable amount of business is carried on by the inhabitants: the principal street, which is three-quarters of a mile long, is composed of well-furnished shops, but there are no handsome buildings in the town. There is a ferry across the Pennar, which is here three-quarters of a mile wide.

Ongole, in 15° 31′ N. lat. and 80° 8′ E. long., is irregularly built, and contains very few buildings better than mere huts made of earth and thatched. It has a fort, in which a small English garrison is constantly stationed. Sarapilly is a place of no importance, in 14° 18′ N. lat. and 80° 2′ E. long.

NELOCURA. [ISOPODA, vol. xiii., p. 53.]

NELSON, ROBERT, born 1656, died 1714, author of various works in practical divinity, which have long been held in very high estimation by serious and pious persons. He is also remarkable for having been a bountiful contributor, both during his life and at his death, to institutions for the education of the poor and the diffusion of Christian knowledge.

He was the grandson of Lewis Roberts, a merchant of London, who is believed to be the person of that name who wrote 'The Merchant's Map of Commerce,' printed in 1638, and whose descendants, the Roberts, Nelson, and Hangers, were very extensively engaged in the trade to the Levant. How far he was himself connected with commerce does not appear; but he was of Trinity College, Cambridge, and while a young man elected a Fellow of the Royal Society. He was intimate with Halley, with whom he travelled in France and Italy.

It was while at Rome that he met with the lady who became his wife in 1682, Lady Theophila Lucy, widow of a baronet and daughter of the earl of Berkeley. This lady was a Roman Catholic, having been led to enter that church by the celebrated Bossuet.

This circumstance was a great grief to Mr. Nelson, whose mind was much occupied with the consideration of both the practical and controversial points in divinity, and whose chief friends were eminent divines in the English Church, particularly Bull, Hickes, Lloyd, and Tillotson: the last especially was his intimate friend.

At the Revolution he scrupled to take the oaths to King William, and remained a non-juror till the year 1709, when he returned to the Church of England as then established.

He died at Kensington, and was buried in the cemetery of St. George's, Queen-square.

The following are his principal works:—'Practice of True Devotion, in relation to the End as well as to the Means of Religion;' 'Companion for the Festivals and Fasts of the Church of England;' 'Great Duty of frequenting the Christian Sacrifice;' 'An Account of the Life and Writings of William Kettlewell.' He also published the English works of Bishop Bull, who had been his tutor, with an account of his life and writings.

The long inscription on Mr. Nelson's monument, written by Bishop Smalridge, may be read in the 'Literary Anecdotes of the Eighteenth Century,' by John Nichols, vol. iv., p. 190, where is a fuller account of the subject of this article.

NELSON, HORATIO, son of Edmund Nelson, rector of Burnham Thorpe, and Catherine his wife, was born at his father's residence in Norfolk, on the 29th September, 1758. His mother died in 1767, leaving eight children, for whom an early provision was desirable, on account of the slender income of their father. Nelson had neither a strong frame nor a hardy constitution, yet his weakness did not disincline him to leave home: he embraced willingly the opportunity of going to sea, which was offered through the position in the navy which was held by his uncle, Captain Suckling, who had been appointed to the Raisonnable, 64, in which Nelson was entered as midshipman. The Raisonnable was soon afterwards paid off, and service in a guard-ship, to which his relation was appointed, being objectionable for a boy, he entered the merchant service, and sought active employment in an outward-bound West Indiaman. Mr. Southey says, 'He returned a good practical seaman, but with a hatred of the king's service, and a saying then common among sailors, "aft the most honour, forward the better man."' To remove this hatred, his uncle received him on board his guard-ship in the Thames, and though this service was less enterprising than might have been desired, it was advantageous to Nelson in two respects; it enabled him to overcome his prejudice against the navy, and to acquire skill in pilotage, which he afterwards turned to good account. By his uncle's influence he obtained a rating on board the Carcass, Capt. Lutwidge, in the North Polar expedition under Capt. Phipps: on his return he was placed on board the Seahorse, and went to the East Indies in her, from whence he was invalided. Recovering his health on the passage home, he was appointed acting-lieutenant to the Worcester, and subsequently lieutenant of the Lowestoffe and the Bristol; commander of the Badger, brig, in Dec., 1778; and post-captain to the Hinchinbroke, June, 11, 1779. He distinguished himself in the siege of Fort San Juan, Nicaragua, and took the island of St Bartolomeo. Pestilence reduced his crew from 200 to 10 men, and Nelson, crippled by disease, was obliged to return home. The Bath waters having restored him, he was appointed to the Albemarle,

in which he cruised during the winter of 1781-2 in the North Sea, whence he was ordered by Lord Sandwich to Quebec. On this station he remained until peace was concluded, when he went for a short time to St. Omer. He was appointed to the Boreas, 28, and sent to the Leeward Islands, in March, 1784. The Americans were then trading with the British colonies on the footing of British subjects, but as they had become foreigners by their separation from Great Britain, and as such were not allowed to trade with those islands, Nelson determined to put a stop to these proceedings, and induced Sir R. Hughes to issue orders to enforce the navigation act, which orders however were subsequently recalled. Nelson then found he must either disobey his orders or the acts of parliament; he determined on the former, and seized four American vessels with freight at Nevis, carrying island colours. The whole colony rose against him, but the ships were ultimately condemned in the admiralty court. He married at Nevis, 4th March, 1787, the widow of Dr. Nisbet, a physician, and daughter of Mr. Herbert, President of that island, who had one son, named Josiah. He returned to England in June, 1787, and lived in retirement till the eve of the French revolutionary war, when he applied for employment. On the 30th of January, 1793, he was appointed to the Agamemnon, of 64 guns, and took with him Josiah Nisbet as midshipman. The fleet, under Lord Hood's orders, reached the south of France at a time when it would willingly have become a separate republic under the protection of England. Nelson was sent with despatches to the court of Naples, where he became acquainted with Sir William and Lady Hamilton. He afterwards joined Commodore Linzee at Tunis, to expostulate with the dey on the impolicy of supporting France. On the passage, he fell in with three French frigates, a corvette, and brig; a running fight of three hours ensued, when a change of wind enabled the enemy to get out of reach of the Agamemnon's guns, which ship had received so much damage in her sails and rigging, that she was unable to renew the action, and the enemy left her unmolested. Subsequently Nelson was detached with a small squadron to co-operate with Paoli in Corsica. The French having withdrawn from St. Fiorenzo to Bastia, Lord Hood, with Nelson as his senior captain, determined to reduce that place with a naval force, General Dundas having refused to co-operate. The garrison capitulated to Lord Hood, May 19, 1794. At the siege of Calvi, whither the Agamemnon was sent to co-operate with Sir Charles Stuart, Nelson lost an eye, from a shot striking the ground near him and driving the sand into it. Here the dog-days and an epidemic thinned his crew, whose health was previously impaired with hard service. Admiral Hotham had now succeeded Lord Hood in the Mediterranean command, and in the partial action with the French fleet which took place soon after, the Agamemnon engaged the Ça Ira; the action was renewed on the following day, when the Agamemnon again engaged the same ship, which was taken, together with the Censeur. Nelson was desirous of continuing the action with the rest of the fleet, but the admiral was satisfied with this slight success. The next service on which he was employed was the blockade of Genoa, in co-operation with the Austrian army, in order to drive the French out of that state. He had a squadron of frigates under his orders, and narrowly escaped capture by the French fleet within sight of the English fleet, which was becalmed in St. Fiorenzo Bay. Another partial action succeeded, in which the French ship L'Alcide, 74, was taken, but burnt by the explosion of some combustibles then in use among the French. Only 200 of her crew were saved. The Austrians, being beaten, gave the French possession of the Genoese coast, and Nelson sailed for Leghorn to refit. Sir John Jervis took command of the Mediterranean fleet in 1795, and Nelson resumed his station in the Gulf of Genoa. He next superintended the evacuation of Bastia, and having effected this, proceeded in the Minerva, Captain George Cockburn, to perform the same service at Porto Ferrajo. On the passage they fell in with two Spanish frigates, took one, and compelled the other to haul off, when a squadron, of which these frigates formed a part, hove in sight, and the prize was retaken. From Porto Ferrajo, Nelson took convoy to Gibraltar, fell in with the Spanish fleet at the mouth of the Straits, and joined Sir J. Jervis with the intelligence. He hoisted his broad pendant as commodore on board the Captain, 74 guns, Captain R. W. Miller, and was eminently distinguished in the general action of February 14, 1797, with the Spanish fleet, in which the Captain, after engaging, with the Culloden, three first-rates and three others, being at length crippled, fell alongside the San Nicolas, of 80 guns, and carried her by boarding. Nelson himself on this occasion boarded through the cabin windows. The San Josef, of 112 guns, was lying on the other side, and he led the boarders from the San Nicolas to her, with the cry of 'Westminster Abbey or victory!' Their efforts were crowned with success, and on the quarter-deck of this Spanish first-rate Nelson received the swords of the rear-admiral and his officers.

Before the news of the action reached England, Nelson had been promoted to the rank of rear-admiral; the order of the Bath was now bestowed on him, and the freedom of Norwich was voted to him, to which city he gave the sword of the Spanish rear-admiral. He now hoisted his flag in the Theseus, and commanded the in-shore squadron employed in the blockade of Cadiz. On the 3rd July, 1797, Lord St. Vincent bombarded that town. In withdrawing the bomb-vessel out of gun-shot, the Spanish gun-boats and launches endeavoured to capture her, but were successfully met by a similar force under Nelson, in which the Spanish commander attempted to carry his boat, and both distinguished themselves personally in a hand to hand fight. His next service was an unsuccessful attack on the town and fort of Santa Cruz, Teneriffe, with three sail of the line, one fifty-gun ship, and three frigates: the British gained a footing on the mole, but were repulsed. In the act of stepping out of his boat, Nelson received a shot through his right elbow. He was with difficulty carried on board his ship, where the arm was immediately amputated. The loss of the English amounted to 1 captain, 6 lieutenants, 37 seamen and marines killed; the admiral, 2 captains, 1 lieutenant, 101 seamen and marines were wounded; 97 were drowned in the Fox cutter, which was sunk; and 5 were missing. Notwithstanding the failure of this enterprise, fresh honours awaited him. He was rewarded with a pension of 1000*l.*, on which occasion he was obliged to present a memorial, which exhibited a singular catalogue of services. He stated that he had been in four actions with hostile fleets, in three with boats employed in cutting out, and at the taking of three towns; employed at Bastia and Calvi; had assisted in capturing seven sail of the line, six frigates, four corvettes, and eleven privateers, taken fifty merchant vessels, and been in action 120 times; lost his right eye and arm, and received other severe wounds. He also received a pension of 1000*l.* a year, and the freedom of the cities of London and Bristol. Early in 1798, Sir Horatio hoisted his flag in the Vanguard, 74, and joined Lord St. Vincent at Gibraltar, by whom he was detached on the 9th May, to watch the port of Toulon, where the expedition for Egypt was then fitting. The Vanguard was dismasted in a heavy gale of wind off Toulon, on the 20th, and, during the thick weather that followed, the French fleet escaped. Having refitted his ship, and being reinforced by eleven sail of the line, he went in pursuit of the French fleet, with the following ships:—Culloden, Goliath, Minotaur, Defence, Bellerophon, Majestic, Zealous, Swiftsure, Alexander, Orion, Theseus, Audacious, and Leander, all of 74 guns.

Nelson heard of the enemy's armament at Malta, and shaped his course to Candia, but getting no tidings there, he returned to Sicily. Having obtained supplies at Syracuse, he sailed for the Morea on the 25th July, obtained intelligence at Coron which caused him to shape his course for Alexandria, where he arrived August 1, 1798, and found the French fleet lying in the bay of Aboukir. The haziness had prevented the two fleets from perceiving each other, although they actually crossed in the night of the 22nd June. The French had reached Alexandria on the 1st July, and Brueys, unable to enter the long-neglected port, moored his fleet, consisting of one first-rate, three second-rates, nine seventy-fours, and four frigates, in Aboukir bay. On perceiving the enemy's position, Nelson adopted the plan projected by Lord Hood in Gourjean Road, but which he had there found impracticable, of stationing his ships one on the outer bow, and another on the outer quarter of each of theirs. The action commenced at 6h. 20m. P.M., August 12th, and at noon of the 13th, of the French fleet one ship had blown up, eight had surrendered, two escaped, and two were aground, of which one yielded, and the other was burnt by her crew. The loss sustained by the English was 218 killed, and 678 wounded; that of the French is variously stated, but it probably amounted to 2000 killed, wounded, and missing. Brueys,

after being thrice wounded, was blown up in his ship L'Orient, part of whose mainmast was made into a coffin by order of Captain Hallowell, and by him presented to Nelson. Nelson received a severe wound in his forehead from a piece of langridge-shot. The Culloden grounded at the commencement of the action, and was unable to take part in it. On this occasion Nelson was created Baron Nelson of the Nile, and pensions of 3000*l.* per annum were settled on him and his two next heirs male. The thanks of the parliament and gold medals were voted to him and all the captains engaged. From this time Nelson remained chiefly employed on the Neapolitan coasts, during which period he sanctioned that which must ever remain a blot on his character, and which tarnished the honour of the British flag—the murder of Prince Carraccioli. Capua and Gaëta now surrendered to the naval force under Nelson's orders. In February, 1800, Nelson sailed for Malta, and captured the French ship of the line Généreux, which escaped from Aboukir, and also a frigate. On Lord Keith's return from England, Nelson came home, leaving Captain Trowbridge in command of the squadron blockading Malta, which island capitulated in September, 1800. Within three months after his return, he separated from Lady Nelson, in consequence of his infatuated attachment to Lady Hamilton. He sailed, March 12, 1801, as second in command to Sir Hyde Parker, to the Baltic, with a fleet of eighteen sail of the line, frigates, bombs, fire-ships, &c., amounting in all to fifty-three sail, having on board the 49th regiment, two companies of rifles, and a detachment of artillery. The fleet arrived in the Sound, and after some time lost in negotiation by Mr. Vansittart, anchored between the island of Huen and Copenhagen. Lord Nelson having offered his services in the attack on the Danish fleet, he was detached with twelve ships of the line and smaller craft, making thirty-six sail, 1st April, 1801, and anchored at dark off Draco Point, two miles from the Danish line. The formidable force opposed to the British consisted of eighteen vessels, mounting 628 guns, chiefly 36 and 34 pounders, manned by 4849 men, moored in a line a mile in length, flanked by two batteries, called Trekroner, of thirty 24-pounders and thirty-eight 36-pounders, with furnaces, commanded by block-ships. The action commenced at nine A.M. and lasted five hours, when a truce was agreed upon by the crown-prince sending the Danish adjutant-general to the commander-in-chief to settle the terms, in reply to Lord Nelson's celebrated note: 'Vice-Admiral Lord Nelson has been commanded to spare Denmark when she no longer resists. The line of defence which covered her shores has struck to the British flag; but if the firing is continued on the part of Denmark, he must set on fire all the prizes he has taken, without having the power of saving the men who have so nobly defended them. The brave Danes are the brothers, and should never be the enemies of the English.' The British killed and mortally wounded were 350; and the wounded 850. The Danish loss was estimated at between 1600 and 1800 men killed and wounded: of the eighteen floating batteries, thirteen were taken or destroyed.

Amicable relations having been restored between England and the northern powers, Lord Nelson returned in command of the squadron to England (Sir Hyde Parker having been recalled), when the thanks of parliament were voted to him for Copenhagen. To allay the public alarm excited by Bonaparte's proposed invasion, Nelson took the command of the shores, reconnoitred Boulogne in the Medusa frigate, attacked the flotilla in the mouth of the harbour, and withdrew with a loss of 172 men, having gained no advantage. From this time he lived in retirement in Surrey, till he was called on to assume the Mediterranean command. He hoisted his flag in the Victory, on war breaking out in 1803. His chief employment was watching the French in Toulon. On the 17th January, 1805, the French fleet put to sea under vice-admiral Villeneuve, but was driven back by heavy gales. Villeneuve sailed again on the 29th of March, received a reinforcement at Cadiz, and made for Martinique, with seventeen sail of the line, seven frigates, and four sloops. On the 12th May, Lord Nelson sailed for the West Indies in pursuit of Villeneuve with ten ships of the line and three frigates, and arrived at Barbadoes on the 4th of June, on which day Admiral Villeneuve sailed from Martinique, and having effected nothing except the recapture of the Diamond Rock, and made prizes of a convoy of fifteen sail of West Indiamen, returned to Europe, and arrived off Cape Finisterre, July 9. Lord Nelson quitted Antigua, June 13th, and made Cape St. Vincent, July 17th, having been absent sixty-six days. Thus frustrated in his plans, he judged best to reinforce the Channel squadron, lest the enemy should bear down on Brest.

With this view he joined Admiral Cornwallis off Ushant, and leaving his fleet there, he went home, and struck his flag. He hoisted it again in the Victory on the 15th of September, 1805, and arrived off Cadiz on the 29th (his birth-day), to take command of the Mediterranean fleet. The force under him consisted of twenty-seven sail of the line, and four frigates, which he withdrew from the vicinity of Cadiz to a station sixteen or eighteen leagues to the westward, in the hope of inducing the enemy to put to sea. On October 21st, at day-break, the combined French and Spanish fleets, consisting of thirty-three sail of the line and seven frigates, were seen a-head twelve miles to leeward. At 11h. 40m., while bearing down in two lines on the enemy, whose position was in the form of a crescent, concave towards the British, Lord Nelson hoisted the celebrated telegraphic signal, 'England expects every man to do his duty.' At ten minutes past noon Collingwood, in the Royal Sovereign, commenced the action on the part of the British. At one P.M. the Victory passed under the stern of the Bucentaur. In the heat of the action, about 1h. 25m., while in the act of turning in his walk on the quarter-deck, Lord Nelson received his death-wound by a musket-ball fired from the Redoubtable, which entered his left shoulder, and lodged in the spine. He expired in three hours and a half. The total British loss was 450 killed, 1250 wounded. Seventeen French and Spanish ships were captured, and one burnt. Admiral Dumanoir escaped to the southward with four sail, which were shortly after taken by Sir R. Strachan. Admiral Gravina, with the remaining eleven ships, got into Cadiz.

On the 9th of January, 1806, the body of Nelson was buried at St. Paul's. His brother William was created an earl, with a grant of 6000*l.* per annum; 10,000*l.* were voted to each of his sisters, and 100,000*l.* for the purchase of an estate.

Sir James Mackintosh says, 'Nelson seems to have been born with a quick good sense, an affectionate heart, and a high spirit; he was susceptible of enthusiasm either of the tender or the proud feelings, and easily melted or inflamed; to say that he was fearless seems unnecessary; he was not merely averse to falsehood or artifice, but he was in the highest degree simple and frank. These qualities formed no small part of his genius; they secured to him attachment and confidence, and revealed to him the feelings of other men, that great secret in the art of command, which reason alone can never disclose. His understanding was concentrated on his profession, and as danger always excites when it does not disturb, by stimulating his mind in the moment of action it roused his genius to the highest exertions. A passion for glory, indignant contempt of money, the sincerity of his character, and energy of his sayings, distinguish him from other modern heroes; while the murder of Carraccioli and his breach of faith to the two garrisons in the Bay of Naples are too atrocious to pass without notice. He believed the prisoners or their ringleaders deserved death, and thought that the existence of the government required a terrible example; by this error in judgment, by the drunkenness of guilty passions, and the maddening power of political fanaticism, he was driven into these deplorable acts.'

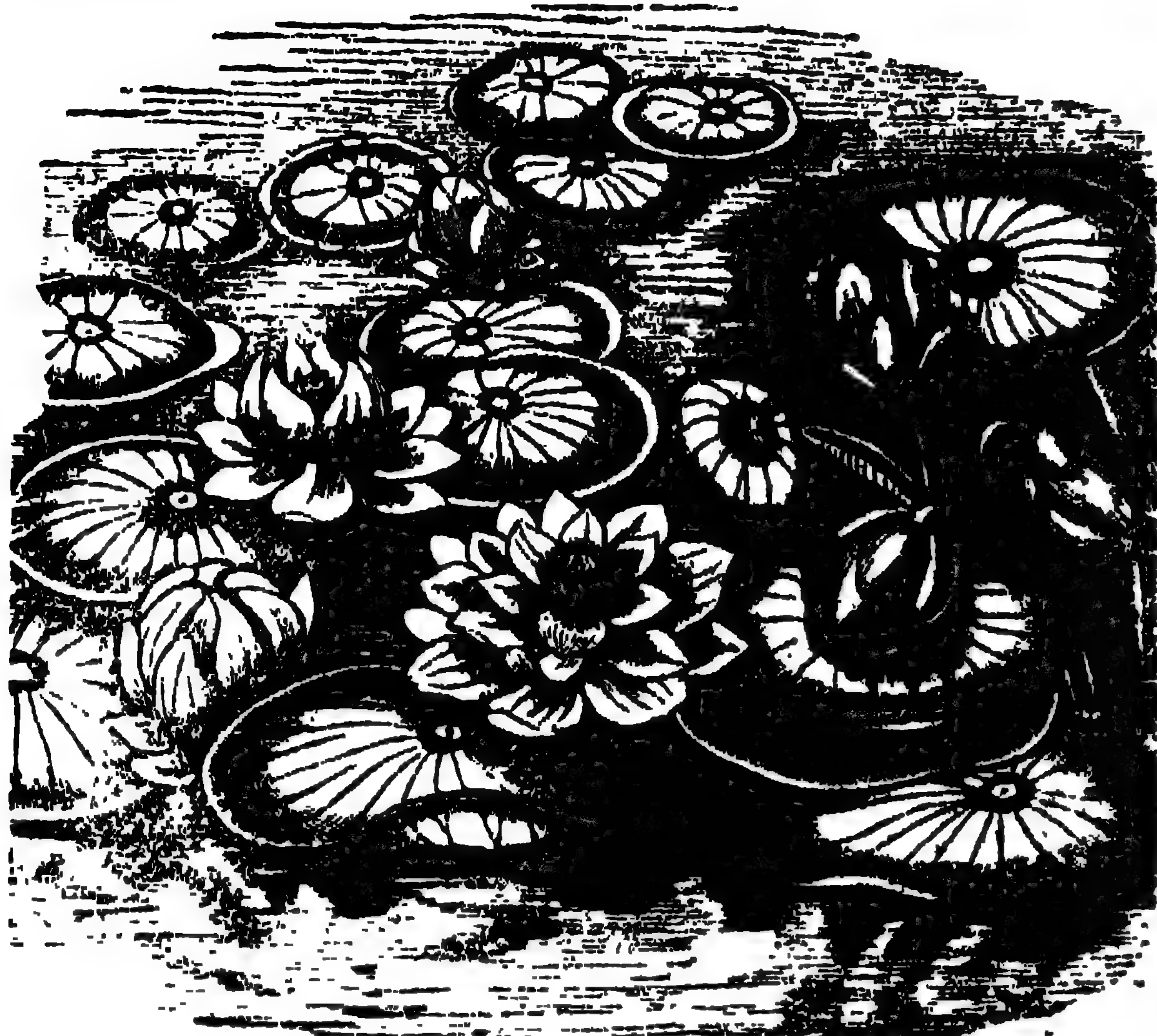
'The death of Nelson,' says Southey, 'was felt in England as a public calamity; yet he cannot be said to have fallen prematurely whose work was done, nor ought he to be lamented who died so full of honours and at the height of human fame.'

(James's *Naval History*; Southey's *Life of Nelson*; Sir J. Mackintosh.)

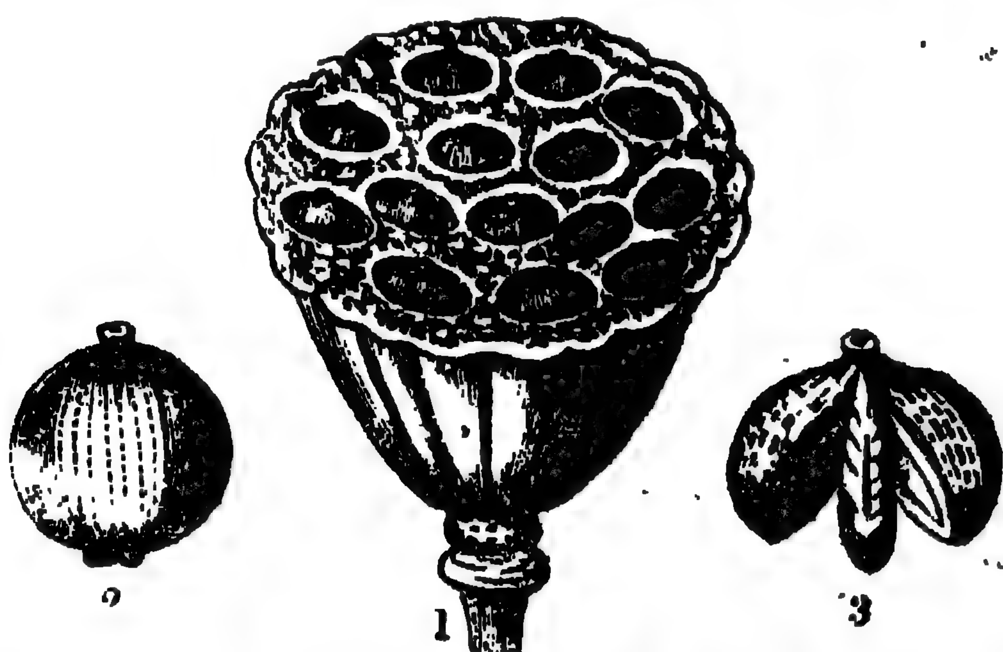
NELUMBIA'CEÆ, a natural order of exogenous plants, by some writers associated with Nymphæaceæ, or Water-lilies, which they resemble in appearance and manner of life, inhabiting the fresh waters of the temperate parts of the world, and producing large polypetalous flowers with numerous stamens. But these orders differ in such important circumstances that they can hardly be regarded as plants of very close alliance, much less as members of the same order; for Nelumbiaceæ have no albumen, and their system of female organs is broken up into its original elements, while in Nymphæaceæ there is an abundance of albumen, and the female system is completely consolidated.

Nelumbiaceæ are readily known by their carpels being distinct, one-seeded, and buried in the cavities of a large

truncated fleshy receptacle, which eventually forms a broad hard bed, filled with holes, in each of which there is a single ripe nut. Notwithstanding their large flowers, these plants must be regarded as among the lowest forms of the exogenous type. The best known species is Nelumbium speciosum, a magnificent water-plant floating in the rivers and ditches of all the warmer parts of Asia, and also found in the Nile: its nuts are supposed to have been the sacred bean of Pythagoras; its fleshy stems are used as food by the poorer inhabitants of China.



Nelumbium speciosum.



1, the ripe receptacle of Nelumbium speciosum; 2, a seed; 3, the same, with the two cotyledons so separated as to show the large plumule which they enclose.

NEMATO'PODA. [CIRRIPEDA.]

NEMATU'RA. [TROCHOIDEA.]

NE'MEAN GAMES, one of the four great national festivals of the Greeks, derived their name from Nemea, a village in the north-eastern part of Argolis, on the borders of the Corinthian territory. They were celebrated under the presidency of the Corinthians, Argives, and inhabitants of Cleonæ (*Scholiast.* on Pindar); but in later times they appear to have been entirely under the management of the Argives. (Liv., xxxiv. 41.) They are said to have been celebrated every third year; and sometimes, as we learn from Pausanias, in the winter (ii. 15, § 2; vi. 16, § 4).

The Nemean games are said to have been first established by the Epigoni, in memory of Opheltes (*Schol.* on Pind.; Apollod., iii. 6, 4; Paus., x. 25, § 2), and to have been afterwards revived by Hercules in honour of Zeus, in consequence of his victory over the Nemean lion.

The crowns bestowed on victors were made of parsley. [OLYMPIC GAMES.]

NEMERTE'SIA. [SERTULARIA.]

NEMESI'ANUS, MARCUS AURELIUS OLYMPIUS, a Latin poet, said to have been a native of Carthage, lived under the reigns of Carus and his sons Carinus and Numerianus. Nothing more is known of the particulars of his life. He wrote a poem on hunting, 'De Venatione,' which he dedicated to Carinus and Numerianus, and which has come down to us unfinished. He also wrote four eclogues, which have considerable poetical merit, and have been repeatedly published, together with the eclogues of his contemporary Calpurnius. Mairault has made a French translation of Nemesianus's eclogues, with copious notes, 8vo., 1744. The writings of Nemesianus have been inserted in the collection 'Poetæ Rei Venaticæ,' with notes, by G. Kempher, Leyden, 1741.

NE'MESIS (Νέμεσις), a female Greek divinity, who appears to have been regarded as the personification of the righteous anger of the gods. She is represented as inflexibly severe to the proud and insolent. (Paus., i. 33, § 2.) According to Hesiod, she was the daughter of Night. (*Theog.*, 223; compare Paus., vii. 5, § 1.) There was a celebrated temple sacred to her at Rhamnus, one of the demi of Attica, about sixty stadia distant from Marathon. In this temple there was a statue of the goddess, made from a block of Parian marble, which the Persians had brought thither to erect as a trophy of their expected victory at Marathon. Pausanias says that this statue was the work of Phidias (i. 33, § 2, 3); but Pliny ascribes it to Agoracritus; and adds that it was preferred by M. Varro to all other statues which existed. (*Hist. Nat.*, xxxvi., 4, § 3.) A fragment, supposed by some to be the head of this statue, was found in the temple of Rhamnus, and was presented to the British Museum in 1820. (*Elgin and Phigaleian Marbles*, i., p. 120; ii., p. 123.) The inhabitants of Rhamnus considered Nemesis to be the daughter of Oceanus. (Paus., vii. 5, § 1.)

The practice of representing the statues of Nemesis with wings was first introduced after the time of Alexander the Great by the inhabitants of Smyrna, who worshipped several goddesses under this name. (Paus., vii. 5, 1; ix. 35, 2.)

According to a myth preserved by Pausanias, Nemesis was the mother of Helen by Zeus; and Leda, the reputed mother of Helen, was only her nurse (i. 33, § 7); but this myth seems to have been invented in later times to represent the divine vengeance which was inflicted on the Greeks and Trojans through the instrumentality of Helen.

There was a statue of Nemesis in the capitol at Rome; though we learn from Pliny that this goddess had no name in Latin. (*Hist. Nat.*, xxviii. 5; xi. 103.)

NEME'SIUS, bishop of Emesa in Syria, and one of the ablest of the antient Christian philosophers. Of his life very few particulars are known; and even the time when he lived is uncertain, though this is generally supposed to have been during the reign of Theodosius the Great, towards the end of the fourth century. He has been accused of holding some of Origen's erroneous opinions, but has been defended by Bishop Fell (*Annot.*, p. 20, ed. Oxon. 1671), who however confesses, with regard to the pre-existence of souls, that he 'differed from the commonly received opinion of the church.' But it is as a philosopher and physiologist that Nemesius is best known, and his work 'De Naturâ Hominis' is one of the most accurate treatises of antiquity. Some persons (among whom we may mention Bishop Fell, in edit. Oxon.; Fabricius, 'Biblioth. Gr.;' and Brucker, 'Hist. Philos.') have even supposed that he was acquainted with the circulation of the blood; but in the opinion of Freind (*Hist. of Physic*), Haller (*Biblioth. Anat.*), and Sprengel (*Hist. de la Médecine*), he has no right whatever to be considered as the author of this discovery. Still the passage which has given rise to the discussion is certainly remarkable: 'The motion of the pulse,' says he, 'takes its rise from the heart, and chiefly from the left ventricle of it: the artery is with great vehemence dilated and contracted, by a sort of constant harmony and order. While it is dilated, it draws with force the thinner part of the blood from the next veins, the exhalation or vapour of which blood is made the aliment for the vital spirit. But while it is contracted, it exhales whatever fumes it has through the whole body and by secret passages, as the heart throws out whatever is fuliginous through the mouth and nose by expiration' (cap. 24, p. 242, ed. Matth.). There is another passage equally curious respecting the bile, which is constituted, he says, 'not only for itself, but also for other purposes; for it helps digestion, and contributes to the expulsion of the excrements, and therefore it is in a manner one of the nourishing powers; besides, as a vital faculty, it imparts a sort of heat to the body. For these reasons therefore it seems to be made for itself: but because it purges the blood, it seems to be made partly for the sake of the blood' (cap. 28, p. 260, ed. Matth.). From this passage Nemesius has been supposed to have known all that Sylvius afterwards discovered with respect to the functions of the bile; but his claim in this case is no better than in the former, and indeed Haller and Sprengel both say that his physiology is not at all more perfect than that of Galen

But even if we cannot allow Nemesius all the credit that has been claimed for him, still from his general knowledge of anatomy and physiology (which is quite equal to that of the professional men of his time), his acuteness in exposing the errors of the Stoics and the Manichees, the purity and elegance of his style compared with that of his contemporaries, and the genuine piety which shows itself throughout his work, he has always ranked very high in the list of antient Christian philosophers. The following opinions in his book are recorded by Sprengel (*Hist. de la Méd.*) as worthy of notice: 1, He calls the substance of the lungs ἀφρώδης σάρξ, 'frothy flesh' (cap. 28, p. 256); 2, he distinguishes the nerves from tendons, and says that the former possess the power of sensation, which the latter do not (cap. 27, p. 251); 3, he says that the semen is prepared in the brain, that it descends by certain vessels (which he calls 'two veins and two arteries') situated behind the ears, which he says is the reason why 'when those veins that are near the ears and those near the carotid arteries (καρωτίδας, or, as some read, παρωτίδας, 'the parotid glands') are wounded, the animal becomes barren;' that it is distributed throughout the whole body, and is deposited at last in the testicles (c. 25, p. 244); 4, he explains the senses, like Aristotle, by an intelligent spirit, which is propagated from the organ of sensation to those of the senses (c. 6, p. 176); 5, he places the sensations in the anterior ventricles of the brain, the intellect in the middle, and the memory in the posterior (c. 13, p. 204); 6, he says that the elements composing the human body are in a manner mutually opposed to each other, and that the assistance of certain intermediate substances is necessary, in order to effect their union (c. 5, pp. 151-156); and 7, that food and medicines only differ inasmuch as the former is similar to the elementary particles of our body, while the latter are opposed to them (c. 1, p. 49). The treatise περὶ φύσεως ἀνθρώπου, 'De Naturâ Hominis,' was first edited by Valla in Latin, Lugd. 1538, ap. Seb. Gryphium; the first Greek edition was by Ellebodius, Antwerp, 1565, 8vo., ap. Christ. Plantin; the next was by Dr. (afterwards bishop) Fell, Oxon., 1671, 8vo.; the last and most complete is by Matthaei, Halæ Magd., 1802, 8vo. There is an English translation by George Wither, Lond., 1636, 12mo., and a German one, by Osterhammer, Salzburg, 1819, 8vo.

NEMORHÆDUS, Colonel Hamilton Smith's name for the Goral antelopes. [ANTELOPE, vol. ii., p. 89.]

NEMO'SIA, a genus of birds established by Vieillot, and placed by Mr. Swainson in the subfamily *Tanagrinæ* in his family *Fringillidæ*. [TANAGRINÆ.]

NE'MOURS. [SEINE ET MARNE.]

NE'MOURS, DUKES OF, a title derived from a town of France in the department of Seine et Marne. It was borne first by a branch of the Armagnac family, the last of whom, Louis d'Armagnac, duke of Némours, held a command in the army of Louis XII., in Italy, against the Spaniards under Gonsalo of Cordova, and was killed at the battle of Cerignola in Apulia, in April, 1503. With him ended the line of Armagnac, which was descended from Caribert, son of Clotarius II., who died A.D. 630. The duchy of Némours was then bestowed by Louis XII. upon Gaston de Foix, son of Mary, the sister of the king. Gaston fell, at twenty-three years of age, in the battle of Ravenna, against the Spaniards and Italians, in 1512. The duchy of Némours was afterwards given by Francis I. to his uncle Philip of Savoy, in 1528, in whose line it continued till 1659; when Henry of Savoy, duke of Némours, died, the last male descendant of Philip. His widow Mary of Orléans, daughter of the duke of Longueville, survived him many years. She inherited in 1694, from her brother the Abbé de Longueville, the county of Neufchâtel, in Switzerland, and died in 1707; with her ended the line of Orléans Longueville. [NEUFCHATEL.] The title of duke of Némours is now borne by the second son of the present king of the French, Louis Philippe.

NEN, River. [NORTHAMPTONSHIRE.]

NE'NNIUS, or NINNIUS, a monk of Bangor, in Wales, who lived in the first part of the ninth century, according to several passages of his own work, if those passages are genuine. Vossius (*De Historicis Latinis*) says that he lived in the early part of the seventh century, but he assigns no authority for this assertion. Nennius states himself to have been a Briton, and not a Saxon, and a disciple of the holy bishop Elbodus, or Elvodug. He wrote a history of Britain, styled 'Eulogium Britanniæ,' which, he says at the beginning, he compiled from all he could find; 'from the Roman annals and the chronicles of the Fathers, as well as from the writings of the Scots and the Angli, and from the traditions of our ancestors.' The history begins with a fabulous genealogy of Brutus, grandson of Æneas, who reigned in Britain. The author afterwards relates the arrival of the Picts in North Britain, and of the Scots in Ireland; and after a brief and confused narrative of the Roman conquest and empire in Britain, he comes to the only part of the work which is deserving of some attention, namely, the Saxon invasion and gradual subjugation of the country. It appears that Nennius's MS. was sadly mutilated and interpolated by an ignorant transcriber, who signs himself 'Samuel,' and 'a disciple of Beularius Presbyter,' and who acknowledges that he left out what he thought useless in Nennius's work, and added what he gathered from other writers concerning the towns and wonders of Britain. See end of chap. 64 of Nennii Banchoriensis *Eulogium Britanniæ*, edited by C. Bertram, and published together with 'Gildas' and 'Richard the Monk of Westminster,' 8vo., Copenhagen, 1757.

NEOLOGY. [RATIONALISM.]

NEO'MERIS, a group of articulated Corallines thus named by Lamouroux. [PSEUDOZOARIA.]

NEOMORPHA, a new genus of birds, established by Mr. Gould on two species from New Zealand; but the specimens wanted the feet and the greater part of the wings.

Generic Character.—Bill longer than the head, compressed at the sides, arched, horny, solid, sharp at the apex, with a denticle. *Nostrils* open, placed in the basal furrow; carinâ mandibulæ superioris in pontem tendente. *Tongue* hard, slender, bristly at the apex; angles of the mouth with pendent fleshy caruncles. *Wings* ——. *Feet* ——. *Tail* as long as the body. Total length of the largest species $17\frac{1}{2}$ inches. (*Zool. Proc.*, 1836, where it is announced as one of the birds from which drawings had been taken for Mr. Gould's great work on the Birds of Australia.) We cannot find the genus either in the 1st or 2nd part, and suppose that the figure is advisedly kept back, in the hope that Mr. Gould may obtain further information as to the wings and feet, before his return from New Zealand and Australia.

NE'OPHRON. [VULTURIDÆ.]

NEOPHYTES (from a Greek word which means 'newly planted') is the appellation given to the converts to Christianity who have just received baptism. In the early church the Neophytes, after that solemn ceremony, wore white garments for eight days. They were also subject to a strict discipline or probation for a much longer period. The Jews, Mussulmans, or Pagans, who are converted to Christianity, are called Neophytes by the Catholic missionaries, and there are houses at Rome and other places for their reception and instruction.

NEO'TRAGUS, Colonel Hamilton Smith's name for the Pygmy Antelopes, the *Guevi* (*Antilope pygmæa*), for instance. [ANTELOPE, vol. ii., p. 82.]

NEOTS, ST. [HUNTINGDONSHIRE.]

NEO'TTIA is a name given to a brown, leafless, scaly plant, found in woods in this country, growing parasitically on the roots of other species. It belongs to the natural order Orchidaceæ, and flowers in May and June. The only species is the *Nidus Avis*, or bird's nest, so called from the appearance of the entangled fleshy fibres of the root. Some modern botanists strangely enough apply the name of Neottia (itself meaning literally a nest) to plants having no entanglement of the roots that can justify the appellation, and more generally called Spiranthes: by those writers the true bird's nest is called Listera nidus avis, a perversion of nomenclature for which there is no necessity, and which no necessity could justify. This genus gives its name to a division in the Orchidaceous order, called after it *Neottieæ*, composed of terrestrial species, especially characterised by the anther being placed at the back of the stigma, not vertically upon the end of the column, and by the pollen being pulverulent.

NEPAUL, or NEPAL, a country in Asia, situated almost entirely within the range of the Himalaya Mountains, between 26° and 31° N. lat. and 80° and 88° E. long. It extends in length from west to east 450 miles, and from north to south, on an average, 100 miles; its surface is about 45,000 square miles, or about 5000 miles less than that of England. On the north it borders on Tibet, on the west on the English province of Kumaon, on the south on the plains of the Ganges, and on the east on Sikim and Bootan.

Surface, Soil, Climate, and Productions.—The Himalaya Mountains are the natural boundary between the elevated table-lands of Central Asia and the extensive lowlands on the banks of the Ganges. The highest part of these mountains is contiguous to the table-lands: towards the plain of the Ganges they slope down with an exceedingly broken surface. The high masses of the range occupy the surface of Nepaul along its northern boundary, and a great portion of this lofty mountain region is always covered with snow. Among the elevated peaks are the highest mountains on the globe. The Dhawalaghiri, or White Mountain, attains in its highest summit, called Ghosa Cotee, an elevation of 28,000 feet above the sea-level. It lies between 28° 30′ and 29° N. lat., and between 82° 30′ and 83° E. long., and is separated by a narrow valley from Mount Swetaghar, or White Tower, which rises to 23,261 feet. Farther east, between 85° and 86° E. long. and 28° and 28° 30′ N. lat., extends the Dhayabung range, in which the Gosaingthan peak rises to 23,044 feet. The Salpu range is between 86° and 87° E. long., on both sides of 28° N. lat.; two of its summits attain more than 24,000 feet. Farther east are the snow-capped summits of the Mirgu range, which have not yet been measured. In the mountains extending west of Dhawalaghiri to the Tri Sula Mountains in Kumaon, the number of snowy peaks is likewise great, and extensive tracts of country between them are covered with snow all the year round, as their surface rises above the line of perpetual congelation. These enormous mountain masses are furrowed by a comparatively small number of very narrow valleys, a circumstance which may be attributed to the small quantity of snow which is annually dissolved. Rain is said to fall on the mountains only in winter, and even then not frequently; and the periodical rains, produced by the south-west monsoon, do not rise to the elevation of the great snow-masses: probably they do not ascend much more than 8000 feet of perpendicular height. Yet during their prevalence the heated vapours which rise from the rain-drenched surface of Bengal and Bahar dissolve a portion of the snow, and the rivers swell to a certain extent, but far less so than in countries where the mountains rise with a more gradual ascent. The narrow valleys are cultivated in their lower parts, where they sink down to about 6000 feet, but the upper parts are only inhabited during four months of the year by herdsmen, who find pasture for their cattle and sheep on the lower declivities of the mountains. They have also a small number of chowry-tailed cattle or jacks. In these regions the Tibet musk (*Moschus moschiferus*, Linn.) is frequent, and also a species of wild sheep, and a kind of wild dog. The antelope Hodgsonii occurs north of the Mirgu range. The few forests contain, in addition to pine-trees and birch, two new species of juniper, which grow to the height of large trees; the boards cut from them are sent to Tibet and China.

The steep descent of this high mountain region lies about 30 miles south of the northern boundary-line of Nepaul, and south of the steep descent extends the elevated region which constitutes the most fertile and best cultivated portion of Nepaul. It varies between 30 and 40 miles in width, and its southern boundary is formed by a range of mountains of moderate height, running at the distance of 15 or 20 miles from the level plains on the Ganges. This range, which, at least in a great part of its extent, is called the Lama Dangra Mountains, may attain in general an elevation of 6000 or 7000 feet above the sea. The surface of the country between the Lama Dangra Mountains and the Himalaya is between 4000 and 5000 feet above the sea, except in some valleys, where it appears to sink considerably below that level. The surface is very uneven and broken, numerous hills and ridges of hills rising to 3000 or 4000 feet above their base, and occupying by far the greatest portion of it. In the northern districts these ridges run mostly north and south, and are connected with the Himalaya; but in the southern they generally extend east and west, parallel to the Lama Dangra range. The valleys which lie between these ridges are long, but generally not more than one or two miles wide: in a few places they expand into plains of moderate extent. Agriculture however is not limited to them; it extends on the declivities of the hills nearly to their summits, when they are not too steep. This country is subject to the periodical rains of the monsoon, which last longer here than in Bengal; and to this circumstance Sir Francis Hamilton ascribes the fact that some fruits, as peaches and grapes, do not ripen, whilst oranges come to the greatest perfection. Pine-apples are only grown in some less elevated valleys, and are of excellent quality. In winter the more elevated summits of the hills are covered with snow, and frost is usually experienced. We know only the mean temperature of the spring. At Khatmandu it is 64° and at Chitlong 58° of Fahrenheit. The principal object of cultivation is rice, to which grain nearly one-half of the cultivated lands are appropriated, as the unevenness of the ground allows irrigation generally. Besides rice, the inhabitants raise maize, cotton, several kinds of legumes, wheat, barley, sugar-cane, and two species of madder. The pastures are indifferent, and hence the number of cattle and buffaloes is small. The small horses, the *Tunguns*, are noted for their hardihood and activity, but they are not natives, but introduced from Tibet, and it is said that they degenerate on the south of the Himalaya Mountains. Sheep are very plentiful; in winter they find pasture on the hills of this country, and in summer they pass to the declivities of the Himalaya Mountains. They are of a large size, give much milk, and have a fine wool. This region also contains several metals in abundance, especially iron, lead, copper, and zinc; the first three are worked rather extensively. Gold is found in the sand of some rivers. The mountainous districts which are not cultivated are covered with large trees, many of which are yet unknown to botanists; but oak, fir, walnut, chesnut, prickly-palms, birch, and others also are frequently found among them. Some of the trees which are yet unknown furnish excellent wood for furniture.

The Lama Dangra range does not extend to the plains on the Ganges, but is divided from them by a hilly tract about 15 miles wide. The hills rise to a considerable height near the range, but subside as they approach the low plain, until they entirely disappear. Some of the valleys between these hills are wide and well cultivated, producing the common grains and plants of Bahar; but most of them are narrow, and these, as well as the hills, are covered with almost uninterrupted forests, consisting principally of oaks, of the Shorea robusta, and of different kinds of laurels, bamboos, &c. On the higher hills are pines and different species of mimosas; from the juice of the latter great quantities of catechu are made, which goes to Patna and Benares. These woods contain numerous parrots, which are trained and sent to Bengal. The climate of this region is very hot: Hamilton found that the thermometer rose to 74° at the end of March.

Nepaul contains a small portion of the Gangetic plain, which is contiguous to the hilly country. It is a portion of the Tarai, or swamp, but of a much better description than that which lies south of Bootan, and belongs to Bengal. The Nepalese Tarai is not a continuous forest, but the greater part of it is covered with a long coarse grass, which at certain seasons is destroyed by setting fire to it, and the herds of cattle pasture on the new grass which immediately springs up. The forests cover a considerable part of the plain, though in several places they have been destroyed, and the ground cultivated. The soil produces good tobacco and cotton. As it is watered by a great number of small rivers, which rise in the hilly tract or in the Lama Dangra range, and the soil is very fertile, it would sustain a great population, but for its unhealthiness. From the beginning of April to the month of September, the inhabitants are exposed to continual diseases, but still the climate is more healthy than that of the Tarai of Bengal, and the country is more populous. The forests contain numerous wild animals. Tigers are rare, but the elephant and the rhinoceros are common; also bears, deer, jackals, foxes, and hares.

Rivers.—Most of the rivers which drain the mountain-region of the Himalaya do not originate on the highest portion of that range, but beyond it, on the table-land of Tibet. This is particularly the case with the two principal rivers which drain Nepaul, the Gunduc and the Coosy. The Gunduc is formed by two branches, which rise 150 miles from one another. The western branch, properly called Gunduc or Salagrani, originates, as it is supposed, not far from the banks of the Sampoo (Brahmapootra), the great river of Tibet. It flows southwards, and after entering Nepaul, runs through the narrow valley which separates the Dhawalaghiri from Mount Swetaghar. It soon leaves the high mountains and enters a tolerably wide valley. At Rerighat it becomes navigable, and continues to be so until it breaks through the Lama Dangra range, where its course is interrupted by some rapids. Soon afterwards it enters the plain of Bahar. The eastern branch, which is called Bori Gun-

duc in its upper course, likewise rises on the table-land of Tibet, and in its south-western course surrounds a portion of the Dhayabung range. Afterwards it runs southwards, and is called Trisul Ganga; it then runs west-south-west, and joins the Gunduc before it breaks through the Lama Dangra range. It does not appear that this branch is navigable. The Coosy is also formed by two branches. The western and principal branch rises within the Himalaya Mountains, in the valley which separates the Dhayabung range from the Salpoo Mountains, and runs first southward and then westward under the name of Bhotiya Coosy. Where it turns to the south-east at Dumja, it becomes navigable, and is called San Coosy. It runs about 100 miles to the east and south-east, until it breaks through the Lama Dangra range, where it has some falls which interrupt navigation. The eastern branch of the Coosy is called Arun: it rises within the Himalaya Mountains, but flows first northwards and enters the table-land of Tibet, on which a considerable part of its course is said to lie, until it turns by degrees southwards and enters Nepaul, where it continues to flow in the same direction to its junction with the San Coosy. Its current is too rapid for navigation.

Towns.—Nepaul contains several considerable towns, which owe their origin or prosperity to the circumstance of this country being the principal thoroughfare by which the table-land of Tibet and the plains of the Ganges exchange their productions or supply their wants. Other towns owe their origin to the fertility of the country which surrounds them. This is particularly the case with those which are found in the plain called Great Nepaul. This plain, which is surrounded by mountains rising from 3500 to 4000 feet above it, is only about twenty miles long and sixteen miles wide, and yet it contains three large towns, Khatmandu, Lalita Patan, and Bhatgong, and several smaller towns. Khatmandu, the present capital of Nepaul, contains 4000 houses, and, as it is said, a population of 48,000 or 50,000. The great number of temples and steeples, built in the style of Tibet, gives to the city a considerable degree of magnificence. The palace of the Ghorcali princes is an extensive but irregular building. Lalita Patan is said to be still larger, and to contain 24,000 houses. Bhatgong, the third royal residence, is stated to contain 12,000 houses, and to exceed the other two in the magnificence and size of its buildings. It is the school of learning, and its temples contain large libraries in Sanscrit and other languages relating to the Buddhist literature. The plain on which these three towns are built is nearly 4800 feet above the sea-level. Kirkpatrick assigns to it a population of half a million, which Hamilton thinks an exaggeration, but he admits that it is cultivated with great care and is very populous.

Noyacote, north-west of Khatmandu, on a high hill, near the banks of the Trisul Ganga, is a considerable place, being situated on the most frequented mountain-road which leads to Tibet along an affluent of the Trisul Ganga, and over the mountain-pass of Kheru. In 1792 the Chinese army invaded Nepaul by this road. Baglung Chaur, in the valley of the Gunduc Proper, or Salagrani, is a large place of trade, being situated on another much frequented road to Tibet. In the western districts of Nepaul is Cheenachin, the capital of Jemlah, or Yumila, built in a plain, which is stated to be not inferior in extent to that of Khatmandu, and equally well cultivated and populous; but its elevation above the sea-level is greater, and the sugar-cane does not succeed: rice, maize, and wheat are raised in abundance. The town is very large, but not regularly built. It has a great trade in horses, salt, musk, and chowry-tails.

In the eastern district of Nepaul, in the wide and well-cultivated valley of the river San Coosy, are several considerable towns, among which the best-known is Calesi. In the valley of the Arun the principal trading place is Tumling Tar, which has 6000 inhabitants; it is situated in a plain six miles wide and nearly eighteen miles long. Hatiya, farther north, has also a considerable commerce with Tibet.

Inhabitants.—Several tribes inhabit the alpine valleys of Nepaul. According to the opinion of Sir Francis Hamilton, the structure of their body shows that they belong to the Mongol race, though some of them, on account of their intermixture with Hindus, rather resemble the Malays, who seem to form a link between the Chinese and Hindus. The best-known of these tribes are the Newars, or Newari, who inhabit the plain of Khatmandu. They have attached themselves to one of the sects of Buddhism, but have introduced the division of castes, and their priests do not depend on the lamas of Tibet. The Newars are mostly cultivators of the soil, and exercise many arts and trades. They make coarse cotton-cloth, and work very well in iron, copper, and brass, and are particularly ingenious in carpentry. This tribe, as well as some others, still speak their own language, which is quite different from those of their neighbours. The higher region of the Himalaya Mountains is occupied by the Bhot, the same nation which inhabits Tibet. Their language seems to be diffused over the greater part of the table-land of Central Asia, and they have a rich literature, which hitherto is little known in Europe. They are Buddhists, and chiefly occupied with their herds and with commerce. The majority of the population south of the high mountain are either Hindus, or a mixed race, the offspring of the Hindus, and native tribes. They are called Parbatiya, because they speak the Parbatiya Basha, a dialect of the Prakrit. This language continually becomes more and more prevalent, and in some districts it has already destroyed the languages of the native tribes. It is spoken by the reigning family and their tribe, the Ghorkas. The Parbatiya adhere to Brahmanism, are employed by the Ghorkas in administration, and occupy themselves with the culture of the ground and commerce.

Commerce.—The trade with Tibet is mostly in the hands of the Bhot, who transport their goods on the backs of sheep or men over the mountain passes. They bring from Tibet to Nepaul sheep, musk, skins of the musk-deer, chowry-tails, quicksilver, borax, sal ammoniac, Chinese silk stuffs, paper, drugs, gold, and silver; and they carry back rice, wheat, oil, iron, copper, cotton-cloth, catechu, juniper-boards (which are used in fine cabinet-work), pepper, spices, indigo, tobacco, otter-skins, sugar, and some smaller articles.

Nepaul exports to British India elephants' teeth, timber, hides, ginger, catechu, turmeric, wax, honey, oranges, long pepper, ghee, bastard cinnamon, large cardamums, and some smaller articles. It exports from the British dominions in Bengal cottons and muslins, silks of various sorts, raw silk, gold and silver, laces, carpets, English cutlery, saffron, spices, sandal-wood, quicksilver, cotton, tin, zinc, lead, soap, camphor, tobacco, pepper, and coral.

History.—In former times this country seems to have been divided among a great number of princes, each of whom was an independent sovereign of a valley, district, or tribe. In the middle of the last century the chief of one of these tribes, the Ghorkas, Goorcas, or Ghorcalis, began to extend his dominions by conquest, and he and his successors were so successful, that in less than half a century they subjected all the countries situated within the mountains between Bootan on the east to the river Sutlej on the west, and they carried more than once their arms to Teshoo Lumboo, in Tibet. In 1792 their depredations on that side were stopped by the Chinese, who entered Nepaul with an army of 70,000 men, and, after several victories, advanced as far as Noyacote. After that time they turned their ambitious views towards the plains of the Ganges, and came to a war with the English in 1814. Though the British arms in the beginning were only partially successful, the Ghorkas, by the peace concluded in 1816, were obliged to cede to the British all the countries situated between the Sutlej and the Kali rivers, and to evacuate the territories of the Sikim Raja. Since that time they have been quiet.

(Kirkpatrick's *Account of Nepaul;* Sir Francis Hamilton's *Account of the Kingdom of Nepaul;* Hodgson's 'Notices on the Languages, Literature, and Religion of the Bauddhas in Nepaul and Bhot,' in *Asiatic Researches*, vol. xvi.)

NEPENTHACEÆ are exogenous plants inhabiting the damper and warmer parts of Asia, and having, in the place of leaves, large hollow bodies, furnished with a lid, and containing water, secreted from a peculiar glandular apparatus with which they are lined. These bodies, or pitchers, as they are called, appear at the end of a leafy tendril-like expansion of the bark, and are considered to be a hollow state of the apex of the petiole of a leaf, while the lid that closes them is regarded as the blade. Their flowers are diœcious, green or brown, apetalous, arranged in cylindrical racemes, and are succeeded by a capsular fruit filled with fine fusiform seeds, which look like very small sawdust. They are considered to be closely akin to Aristolochiaceæ, and with them have been recently referred by the writer of this to a

new class in the vegetable kingdom called Homogens. [PTYCHOGENS.]



Nepenthis distillatoria.

1, a male flower; 2, a female flower; 3, a vertical section of the ripe capsule; 4, a vertical section of a seed very much magnified; 5, the seeds.

NEPER. [NAPIER.]

NEPHELINE. *Sommite.* This mineral occurs in attached hexagonal prisms. Primary form a rhomboid. Indications of cleavage parallel to the planes of the prism. Fracture conchoidal, shining. Hardness, scratches glass. Colour white; streak the same. Lustre vitreous. Transparent, translucent. Specific gravity 2·360.

When a transparent fragment is put into cold nitric acid it becomes cloudy, and afterwards gelatinizes. Before the blow-pipe the edges are rounded; with borax it slowly melts into a colourless transparent glass.

Occurs on Monte Somma, Vesuvius; and in the lava of Capo di Bore near Rome.

Analysis by Arfwedson, from Vesuvius:—Silica, 44·11; Alumina, 33·73; Soda, 20·46.

NEPHRITE. *Jade; Axe Stone.* Occurs in masses. Structure compact. Fracture coarse, splintery. Hardness 7·0. Very tough. Colour dark-green and green of other shades. Translucent on the edges. Specific gravity 2·9 to 3. Before the blow-pipe, whitens but does not fuse, but with borax forms a transparent glass.

Analysis by Kästner:—Silica, 50·50; Alumina, 10·00; Magnesia, 31·00; Oxide of iron, 5·50; Oxide of chromium, 0·05; Water, 2·75.

NEPHRITIS. [KIDNEYS, DISEASES OF.]

NEPHROPS. [HOMARUS, vol. xii., p. 274.]

NEPOS, CORNE'LIUS, a native of Hostilia (now Ostiglia) on the Po, was a Roman writer and a friend of Cicero, who speaks of Nepos in several of his Letters (*Epist. ad Attic.*, xvi. 5 and 14). Macrobius (*Saturn.*, xi. 1) quotes the second book of Cicero's Epistles to Cornelius Nepos, which have not come down to us. Lactantius mentions Nepos's Letters to Cicero, and Aulus Gellius (xv. 28) speaks of Nepos's 'Life of Cicero.' Catullus dedicated his poems to him. Nepos however was most intimate with Pomponius Atticus, whom he survived a few years, and whose life he wrote. He also wrote a short notice of Cato the Censor, in which he says that, at the particular request of T. Pomponius Atticus, he had written a more extended biography of Cato, which however has been lost. According to the old scholiasts, the lives of Atticus and Cato formed part of a larger work of Nepos, 'De Historicis Latinis.' In a passage in the Life of Dion, in the 'Vitæ Imperatorum,' attributed to Nepos, the author mentions a work which he had written 'on the Greek historians,' and the grammarian Charisius (*Instit. Grammat.*, lib. i.) quotes a sentence of the sixteenth book 'Illustrium Virorum' of Cornelius Nepos.

The work styled 'Vitæ Imperatorum,' which is put into most schoolboys' hands, not being mentioned by any antient writer, was for a long time attributed to Æmilius Probus, who lived in the fourth century, and who in the MSS. appears as having presented a copy of the book to the emperor Theodosius I., and prefixed to it some verses in which he seems to claim the authorship. Accordingly the earlier editions of the 'Vitæ Imperatorum,' the first by Janson, 1471, that of 1506, and others, were entitled 'Probi Æmilii Excellentium Imperatorum Vitæ.' But afterwards the critics began to question the claims of Probus to the authorship of the work. The style and especially the sentiments of the lives certainly appear not suited to a writer of the age of Theodosius, such as the manifest disapprobation of a monarchical government, which is exhibited in many passages, among others in the lives of Timoleon (i. 3) and Dion (ix. 5). It is remarkable that the author in his preface addresses the work to Atticus; and yet at the end of the last life, that of Hannibal, when speaking of the uncertainty about the date of that great commander's death, he says that 'Atticus, in his "Annals," had left it written ('scriptum reliquit') that Hannibal died under the consulship of M. C. Marcellus and Q. F. Labeo;' speaking thus of Atticus as of a person dead. After the first editions of the 'Vitæ Imperatorum' were published, Petrus Cornerus found in an old MS. containing the letters of Cicero to Atticus, the life of Atticus and the short notice of Cato the Censor above mentioned. These two biographies were published together with the 'Vitæ Imperatorum,' and the whole under the name of Æmilius Probus, contrary to all evidence, as the author of those two biographies speaks of Atticus as a personal acquaintance. At last Lambini, in the commentary to his edition of the 'Imperatorum Vitæ,' 1568, asserted the claims of Nepos as author of the whole. But several solecisms and barbarisms which occur in the 'Vitæ' appearing to invalidate Lambini's supposition, as not being likely to occur in a writer of the Augustan age, Barth and some other critics have supposed that Probus abridged the original work of Nepos in the same manner as Justin has epitomised the history of Trogus Pompeius. Vossius however (*De Historicis Latinis*, i. 14), Funccius (*De Virili ætate linguæ Latinæ*, part 11, ch. 14, § 38), and others, maintain that there is nothing in the 'Vitæ Imperatorum' which could not have been written by the Cornelius Nepos of the Augustan age, and that neither Probus nor any writer of the Theodosian age could have written in so pure a Roman style. Tzschucke's Proemium to his edition of Nepos, Göttingen, 1804; Schoell, 'Abrégé de l'Histoire de la Littérature Romaine;' and Dunlop, 'History of Roman Literature,' may be consulted as to this controversy. It is worthy of remark that in some of the old MSS. of the 'Vitæ Imperatorum,' which furnished the text of the earlier editions, there is written at the end, 'Completum est opus Æmilii Probi, Cornelii Nepotis,' as if the copyist had been in doubt as to the real author. (Lambini, *Commentarius.*)

The 'Vitæ Imperatorum' are short biographies of twenty Greek commanders, and of two Carthaginian, Hamilcar Barcas and Hannibal. From a passage at the end of the last it appears that the author intended to write also the lives of the great Roman commanders, 'that their exploits might be compared with those of the Greek, in order to judge which were the greatest.' These lives of the Roman commanders, if ever written, have not come down to us, but it seems that some of them at least were written, and, it would appear, by Nepos, as Plutarch quotes the authority of Nepos for facts concerning the lives of Marcellus and Lucullus. The 'Vitæ Imperatorum,' besides the faults in language which are pointed out by Tzschucke in his proemium and in the commentary which follows the text, contain many erroneous statements of facts, such as mistaking Miltiades, the son of Cypselus, for the great Miltiades, the son of Cimon, confounding the battle of Mycale with that of the Eurymedon, and others

which are noticed by Tzschucke and Schooll. The author however gives many details of private life and manners, which are curious, as in the life of Epaminondas. The sentiments expressed by the author of the 'Vitæ' are generous and virtuous, though often puerile and trifling. The sketch of the character of Alcibiades has been admired for its graphic touches; but the life of Pomponius Atticus is much better both for the matter and manner than any of the rest, and, although too panegyrical, gives a lively description of his character. [ATTICUS.] It has been translated into English by Sir Matthew Hale, 1677, and by the Rev. E. Berwick, 1813.

The editions of the 'Vitæ Imperatorum' are numerous: those of Longolius, 1543; Lambinus, 1569; Bosius, 1657; Van Staveren, 1734, 1773; Tzschucke, 1804; Harles, 1806; Fischer, 1806: and lastly, Breme, 1827, are reckoned the best.

NEPOS, FLA'VIUS JU'LIUS, was the nephew of the patrician Marcellinus, who, in the confusion into which the affairs of the Western Empire had fallen after the death of Majorianus, A.D. 460, made himself independent sovereign of Dalmatia, was acknowledged as such by Leo I., emperor of the East, and was afterwards killed in Sicily in an expedition against the Vandals. Leo, having given his niece in marriage to Nepos, named him emperor of the West, A.D. 473, after the death of Olybrius. But a certain Glycerius, supported by the Burgundian and other barbarian auxiliaries who were then the real masters of Italy, had already been proclaimed emperor at Ravenna. Nepos sailed from Constantinople with some troops in 474, and landing at Ostia, surprised Glycerius in Rome, made him prisoner, and, having stripped him of the imperial garments, caused him to be ordained bishop of Salona in Dalmatia, which was considered as a kind of exile. Nepos made peace with Euric, king of the Visigoths, by ceding to him the provinces of Gaul which lay west of the Rhone. But soon after, A.D. 475, Orestes, a native of Pannonia, who had long served in the Roman armies, revolted against Nepos, and marched upon Ravenna, when the emperor, unable to oppose him, fled across the sea to Dalmatia, over which province he seems to have retained his authority, with the title of Augustus; whilst Orestes had his own infant son Romulus proclaimed emperor of the West. Nepos applied in vain to Zeno, emperor of the East, to assist him in recovering Italy. In the year 480 he was murdered at Salona by two officers of his court, upon which Odoacer, who then ruled over Italy, passed over into Dalmatia and conquered that province. Nepos is said to have been a good and amiable but weak man, and unfit for the times. Sidonius Apollinaris praises him for the excellent choice which he made f those whom he employed under him.

NEPTÆA, a genus of alcyoniform Zoophyta, established by Blainville.

NEPTU'NUS, or NEPTUMNUS, a Roman divinity, whose attributes are nearly the same as those of the Greek Poseidon (Ποσειδῶν). Poseidon was the son of Kronus and Rhea, and the brother of Jupiter and Juno, and appears to have been one of the antient divinities of Greece; although, according to Herodotus (ii. 50), he was not originally a Greek deity, but was imported from Libya. Poseidon was the god of the water in general, of the sea, the rivers, and the fountains; but he was more particularly regarded as the god of the sea, which he acquired as his share in the division of the dominions of his father Kronus. His wife was Amphitrite, and their son Triton.

Poseidon is said to have produced the horse in his contest with Athena (Minerva) for the right of naming the city of Athens; by which myth we are to understand, according to the interpretation of some writers, that the horse was imported into Greece by sea. But this explanation is far from satisfactory. It is difficult to give a reason for the connection of Neptune with the horse; but it is evident from several passages in the Greek writers that he was regarded as a kind of equestrian deity, as well as the god of the sea. (Aristoph., *Knights*, l. 449.) Poseidon had a magnificent palace beneath the sea at Ægæ (*Il.*, xiii. 20). The animals offered to him in sacrifice were usually black bulls, rams, and boar pigs.

Poseidon was not originally a god of the Doric race. He was principally worshiped by the Ionians, who were in most places a maritime people. In those Dorian cities however which had acquired a love for foreign commerce, we find that the worship of Poseidon prevailed extensively; as for instance, at Tænarum, whence it was carried to Tarentum, at Cyrene, in Ægina, and more particularly on the Corinthian isthmus, and at Trœzen, from which place the worship of this god was transmitted to Posidonia in Italy. (Müller's *Dorians*, vol. i., p. 417, 418, tr.)

The etymology of the names Poseidon and Neptunus is doubtful. Poseidon is written in Doric Greek, Poteidan (Ποτειδᾶν), of which we have another example in the name of Potidæa, written Poteidaia (Ποτειδαία) in the inscription, now in the British Museum, on those Athenians who fell before this city. The name, according to some writers, contains the same root, in the first syllable, as we find in ποτός and ποταμός. Neptunus is derived by Cicero from *nando* (*Nat. Deor.*, ii. 26); and by Varro from *nuptu*, because this god covers (*obnubit*) the earth with the sea (*De Ling. Lat.*, iv. 10); but neither of these derivations has the least show of probability. We may compare the form of the word Nept-unus or -umnus, with Port-umnus, Vert-umnus, and the word al-umnus; but the meaning or origin of the root *Nept* or *Nep* seems uncertain. It may perhaps be connected with the same root as is contained in the Greek νίπ-τω.

The statues of Neptune resembled in many respects those of Jupiter; but the figure of the former was more angular, and there was less of repose and thoughtfulness in the countenance. The Greek sculptors gave a certain degree of roughness to the statues of Neptune, which appears to have been regarded as appropriate to the god of the ocean. His hair was usually somewhat in disorder, and the whole of his figure was represented as exceedingly powerful and muscular. Hence the 'chest of Poseidon' (στέρνον Ποσειδάωνος, *Il.*, v. 479) is the poetic expression for this characteristic of the deity, which is illustrated by the noble fragment from the pediment of the Parthenon in the British Museum. (*British Museum*, 'Elgin Marbles,' vol. ii., p. 26.) His right hand held the trident; and he was usually surrounded by dolphins and other marine objects. (Müller's *Archäologie der Kunst*, p. 452.)

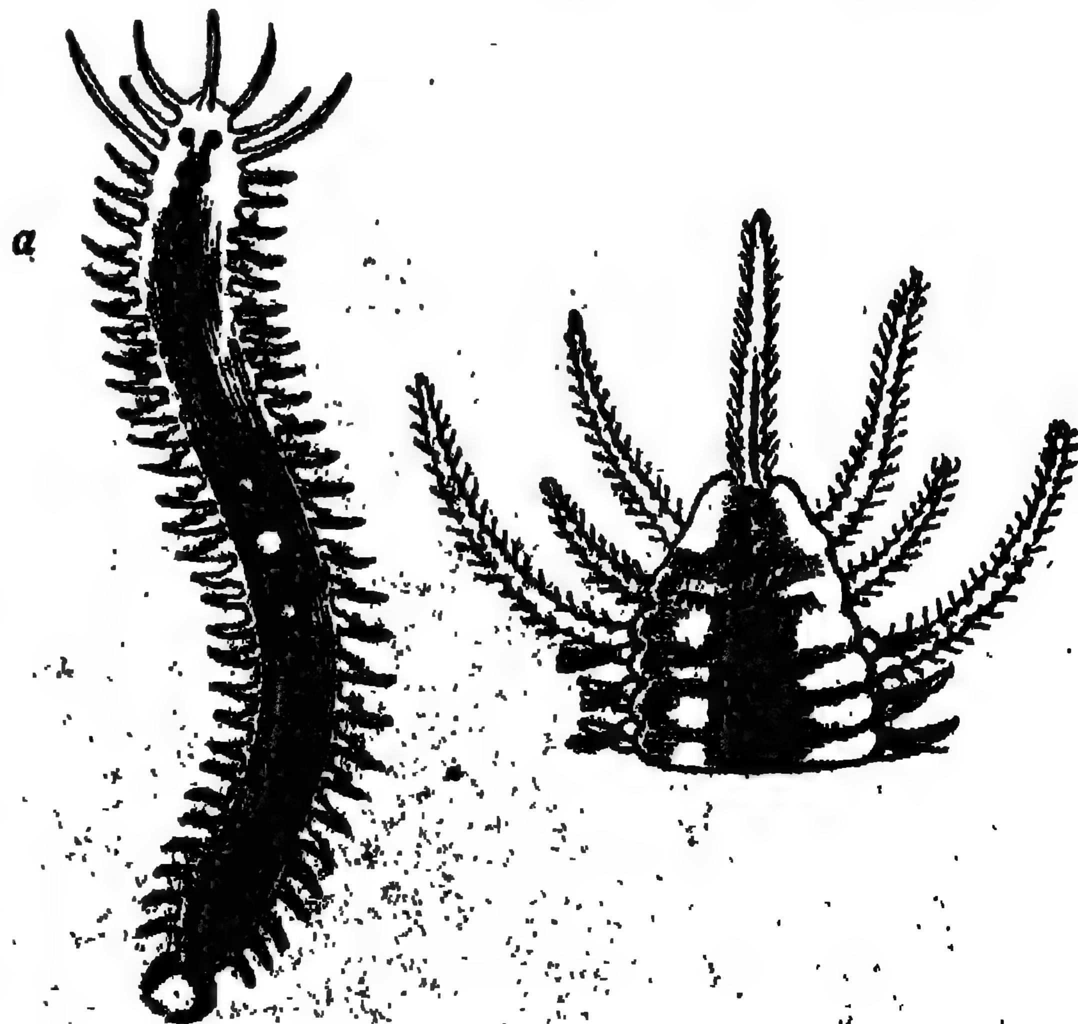
NERAC. [LOT ET GARONNE.]

NERBUDDA. [HINDUSTAN, vol. xii., p. 211.]

NEREIDS (Νηρηΐδες), nymphs of the sea, were the daughters of Nereus and Doris. Nereus was the eldest son of Pontus and the Earth (Hesiod, *Theog.*, 233); and Doris was one of the daughters of Oceanus. The Nereids are said by most antient writers to have been fifty in number, but Propertius makes them a hundred (iii. 5, 33). The most celebrated of them were Amphitrite, the wife of Poseidon; Thetis, the mother of Achilles; Galatea, Doto, &c.

The worship of the Nereids was generally connected, as might be supposed, with that of Poseidon. Thus they were worshiped in Corinth, where Poseidon was held in especial honour, and in other parts of Greece. (Paus., ii. 1, § 7, 8; compare iii. 26, § 5; v. 19, § 2.) The Nereids were originally represented as beautiful nymphs [NYMPHS]; but they were afterwards described as beings with green hair, and with the lower part of their body like that of a fish. (Plin., *Hist. Nat.*, ix. 4.)

NE'REIS (Zoology), Cuvier's name for a genus of Dor-



Nereis (Syllis) phosphorescens.
a, the animal, ½ inch focus; b, head of the same, $\frac{1}{10}$ inch focus. (Garner,

sibranchiate Annelids, comprehending the genus *Lycoris* of Savigny. Tentacles equal in number are attached to the sides of the base of the head; a little more forward are two other biarticulated ones, and between them two simple ones: they have only one pair of jaws in their proboscis (trompe). The branchiæ only form small laminæ on which a net-work of vessels creeps: there are besides two tubercles to each of their feet, two bunches of filaments, a cirrhus above, and one below.

Lamarck states that the antennæ of the Nereids are in general short. The eyes, when distinct, he says, are four in number. The proboscis is large, open at its extremity, and often furnished with salient points or small tentacles. Lamarck divides them into six genera, viz.: *Lycoris*, *Nephtys*, *Glycera*, *Hesione*, *Phyllodon*, and *Syllis*, principally on the ground of the presence or absence of jaws and the modifications of the antennæ. To these he adds *Spio*.

Geographical Distribution.—The Nereids are widely spread, and some of the species are found in most seas. Some are found on our own coasts.

NERI, FILIPPO DE', born in 1515, of a noble Florentine family, after studying in his native country, proceeded to Rome, where he fixed his residence. Naturally of warm feelings and benevolent disposition, he turned his whole attention to the relief of the poor, the instruction of children, and the reclaiming of vicious persons. In the pursuit of these objects he displayed a sincerity and a single-heartedness which exposed him to the sneers and the slanders of the worldly, the prudish, and the sticklers for outward decorum. The particulars of his life, some of which are very curious, have been fully narrated by his biographers Bacci and Gallonio. He founded an asylum for poor and sick strangers, and other houseless or helpless persons, in which they were sheltered until they were able to return to their home. Having taken holy orders, he associated with himself several pious friends, among whom was Baronius, afterwards a cardinal. They performed spiritual exercises together, and instructed the poor, and especially youths, in the streets, at the doors of the churches, and in the market-places. He attended the sick and the dying, visited the prisoners, and pleaded in the courts of justice for the oppressed. Neri was not gloomy or morose; his piety was not repulsive: he conversed freely with all kinds of people; and being a man of education and general information, he entered into the spirit of their respective pursuits, and joined in their harmless mirth, whilst he checked any excess or vicious tendency. He was the founder of the oratorios, or sacred musical entertainments, the object of which was to attract the youth and wean them from the public theatres and their temptations. At first the oratorios were hymns which were sung after the sermon, accompanied by music. Afterwards dramas were introduced, founded upon scriptural subjects, and some of them were written by distinguished writers, such as Zeno and Metastasio, and the parts were sung like those of an opera, with this difference, that there was no acting or stage, the singers being stationed in a gallery of the chapel. The chapel being called in Italian 'Oratorio,' that is, a place of prayers, gave its name to the performance; and the congregation or order constituted by Neri took the name of 'Fathers of the Oratory.' But Neri, more prudent in this than other founders of monastic orders, did not bind the members of his congregation by perpetual vows: he said that the spirit of charity should be the only common bond. The institution was approved of by Gregory XIII. in 1575, and it soon spread over Italy, France, and other countries. The congregation 'de l'Oratoire' has produced many distinguished men, Baronius and Massillon among others. Study, preaching, and the education of youth are the chief occupations of its members. Their handsome church at Rome, Santa Maria in Vallicella, has a good library, and the oratorios continue to be performed in a chapel devoted to the purpose. Neri, after resigning the generalship of his congregation to his disciple Baronius, died in 1595. He was canonised by Gregory XV. Some of his letters, and his 'Ricordi,' or advice to youth, have been published, as well as two sonnets out of many which he composed. He was an amiable, virtuous, and religious man, and his example had a great influence on the clergy of Rome.

NERI, POMPE'O, was born at Florence in 1707. After studying in the university of Pisa, he was made professor of law in that institution. He was afterwards appointed by Francis of Lorraine, the new grand-duke of Tuscany, secretary to his council. In 1749 Maria Theresa called him to Milan and made him president of the 'Giunta di Censimento,' or commission for the valuation of all the landed property in Lombardy. This undertaking was effected, and the tax was laid equally upon all landed property: the new 'Cadastro,' or register, was published in 1759. The communal administration was at the same time reorganised. This example was followed by several Italian and other governments. The empress also commissioned Neri to confer with the Sardinian minister for a concordat concerning the currency of both states. It was in consequence of this commission that Neri wrote and published his book on currency, 'Osservazioni sopra il Prezzo Legale delle Monete,' 1751. In 1758 Neri, being recalled to Florence, was named one of the counsellors of the regency during the minority of Leopold. He died at Florence in 1776. Besides the work above mentioned, he wrote other treatises on political economy, on taxation, on the municipal laws in Tuscany, and on the former contrasted with the actual condition of the nobility in that country. Neri ranks among the first Italian economists of the eighteenth century, with Carli, Verri, Genovesi, and others.

NERI'TA. [TROCHOIDEA.]

NERI'TIDÆ. [TROCHOIDEA.]

NERITI'NA. [TROCHOIDEA.]

NERITOPSIS. [TROCHOIDEA.]

NERO, CLAU'DIUS CÆSAR, the sixth of the Roman emperors, was born at Antium in Latium, in the latter end of A.D. 37, nine months after the death of Tiberius (Suet., *Nero*, c. 6). He was the son of Domitius Ahenobarbus and Agrippina, the daughter of Germanicus, and was originally named Lucius Domitius. After the death of Domitius and of a second husband, Crispus Passienus, Agrippina married her uncle the emperor Claudius, who gave his daughter Octavia in marriage to her son Lucius, and subsequently adopted him with the formal sanction of a Lex Curiata. (Tacit., *Ann.*, xii. 26.)

The education of Nero was carefully attended to in his youth. He was placed under the care of the philosopher Seneca, and he appears to have applied himself with considerable perseverance to study. He is said to have made great progress in the Greek language; of which he exhibited a specimen in his sixteenth year by pleading in that tongue the rights or privileges of the Rhodians and of the inhabitants of Ilium. (Suet., *Nero*, c. 7; Tac., *Ann.*, xii. 58.)

On the death of Claudius, A.D. 54, Nero succeeded to the sovereign power. Agrippina, who had paved the way for the accession of her son by the murder of her husband, endeavoured to obtain the chief management of public affairs; and her vindictive and cruel temper would have hurried Nero, at the commencement of his reign, into acts of violence and bloodshed, if her influence had not been counteracted by Seneca and Burrus, to whom Nero had entrusted the government of the state. Through their counsels the first five years of Nero's reign were distinguished by justice and clemency. He discouraged public informers, refused the statues of gold and silver which were offered him by the senate and people, and used every art to ingratiate himself with the people. But his mother was enraged to find that her power over him became weaker every day, and that he constantly disregarded her advice and refused her requests. His neglect of his wife Octavia, and his criminal love of Acte, a woman of low birth, still further widened the breach between him and his mother. She frequently abused him with the most contemptuous language; reminded him that he owed his elevation to her, and threatened that she would inform the soldiers of the manner in which Claudius had met his end, and would call upon them to support the claims of Britannicus, the son of the late emperor. The threats of his mother only served to hasten the death of Britannicus [BRITANNICUS], whose murder forms the commencement of that long catalogue of crimes which afterwards disgraced the reign of Nero.

But while the management of public affairs appears from the testimony of most historians to have been wisely conducted by Burrus and Seneca, Nero indulged in private in the most shameless dissipation and profligacy. He was accustomed, in company with other young men of his own age, to sally into the streets of Rome during the night in order to rob and maltreat the passengers, and even to break into private houses and take away the property of the owners. But these extravagancies were comparatively harmless; his

love for Poppæa, whom he had seduced from Otho, led him into more serious crimes. Poppæa, who was ambitious of sharing the imperial throne, perceived that she could not hope to obtain her object while Agrippina was alive, and accordingly induced Nero to consent to the murder of his mother. The entreaties of Poppæa appear to have been supported by the advice of Burrus and Seneca; and the philosopher did not hesitate to palliate or justify the murder of a mother by her son. (Tac., *Ann.*, xiv. 11; Quint., *Inst. Orat.*, viii., c. 5.

In the eighth year of his reign Nero lost his best counsellor Burrus, and Seneca had the wisdom to withdraw from the court, where his presence had become disliked, and where his enormous wealth was calculated to excite the envy even of the emperor. About the same time Nero divorced Octavia and married Poppæa, and soon after put to death the former on a false accusation of adultery and treason.

In the tenth year of his reign, A.D. 64, Rome was almost destroyed by fire. Of the fourteen districts into which the city was divided, four only remained entire. The fire originally began at that part of the Circus which was contiguous to the Palatine and Cœlian hills, and raged with the greatest fury for six days and seven nights; and after it was thought to have been extinguished, it burst forth again and continued for two days longer Nero appears to have acted on this occasion with the greatest liberality and kindness; the city was supplied with provisions at a very moderate price; and the imperial gardens were thrown open to the sufferers, and buildings were erected for their accommodation. But these acts of humanity and benevolence were insufficient to screen him from the popular suspicion. It was generally believed that he had set fire to the city himself, and some even reported that he had ascended the top of a high tower in order to witness the conflagration, where he amused himself with singing the destruction of Troy. From many circumstances it appears improbable that Nero was guilty of this crime. His guilt indeed is expressly asserted by Suetonius and Dion, but Tacitus admits that he was not able to determine the truth of the accusation. In order however to remove the suspicions of the people, Nero spread a report that the Christians were the authors of the fire, and numbers of them were seized and put to death. Their execution served as an amusement to the people. Some were covered with skins of wild beasts, and were torn to death by dogs, others were crucified, and several were smeared with pitch and other combustible materials, and burned in the imperial gardens in the night: 'Whence,' says the historian, 'pity arose for the guilty, though they deserved the severest punishments, since they were put to death not for the public good, but to gratify the cruelty of one man.' (Tac., *Ann.*, xv. 44.)

In the following year, A.D. 65, a powerful conspiracy was formed for the purpose of placing Piso upon the throne, but it was discovered by Nero, and the principal conspirators were put to death. Among others who suffered on this occasion were Lucan and Seneca; but the guilt of the latter is doubtful. In the same year Poppæa died, in consequence of a kick which she received from her husband, while she was in an advanced state of pregnancy.

During the latter part of his reign Nero was principally engaged in theatrical performances, and in contending for the prizes at the public games. He had previously appeared as an actor upon the Roman stage; and he now visited in succession the chief cities of Greece, and received no less than 1800 crowns for his victories in the public Grecian games. On his return to Italy he entered Naples and Rome as a conqueror, and was received with triumphal honours. But while he was engaged in these extravagancies, Vindex, who commanded the legions in Gaul, declared against his authority; and his example was speedily followed by Galba, who commanded in Spain. The Prætorian cohorts espoused the cause of Galba, and the senate pronounced sentence of death against Nero, who had fled from Rome as soon as he heard of the revolt of the Prætorian cohorts. Nero however anticipated the execution of the sentence by requesting one of his attendants to put him to death, after making an ineffectual attempt at suicide. He died, A.D. 68, in the thirty-second year of his age, and the fourteenth of his reign.

It is difficult to form a correct estimate of the character of this emperor. That he was a licentious voluptuary, and that he scrupled at committing no crimes in order to gratify his lust or strengthen his power, is sufficiently proved; but that he was such a monster as Suetonius and Dion have described him, may reasonably admit of doubt. The possession of absolute power at so early an age tended to call forth all the worst passions of human nature, while the example and counsels of his mother Agrippina must have still further tended to deprave his mind. Though he put to death his adoptive brother, his wife, and his mother, his character appears to have been far from sanguinary; his general administration was wise and equitable, and he never equalled in his worst actions either the capricious cruelty of Caligula or the sullen ferocity of Domitian. Nero was a lover of the arts, and appears to have possessed more taste than many of the emperors, who only resembled him in their profuse expenditure. The Apollo Belvedere is supposed by Thiersch (*Epochen der bildenden Kunst unter den Griechen*, p. 312), and some other writers, to have been made for this emperor.

His government seems to have been far from unpopular. He was anxious to relieve the people from oppressive taxes, and to protect the provinces from the rapacity of the governors; and it may be mentioned as an instance of his popularity, that there were persons who for many years decked his tomb with spring and summer flowers, and that in consequence of a prevalent rumour that he had escaped from death, several impostors at various times assumed the name of Nero and gave no small trouble to the reigning emperors. (Tac., *Hist.*, i. 2; ii. 8; Suet., *Nero*, c. 57, and Casaubon's note.) During the reign of Nero, the Roman empire enjoyed in general a profound state of peace. In the East the Parthians were defeated by Corbulo; and in the West the Britons, who had risen in arms under Boadicea, were again reduced to subjection by Suetonius and Paulinus. [BOADICEA.]

(Tacitus; Suetonius; Dion Cassius.)





Coin of Nero.
British Museum. Actual size. Copper.





Reverses of Coins of Nero.

NERO'CILA. [ISOPODA, vol. xiii., p. 52.]

NEROS. [SAROS.]

NERTSHINSK MOUNTAINS. [ALTAI.]

NERTSHINSK. [SIBERIA.]

NERVA, MARCUS COCCEIUS, the thirteenth Roman emperor, was born at Narnia, in Umbria, in A.D. 27, according to Eutropius (viii. 1), or in A.D. 32, according to Dion (lxviii. 4). His family originally came from Crete; but several of his ancestors rose to the highest dignities in the Roman state. His grandfather, Cocceius Nerva, who was consul, A.D. 22, and was a great favourite of the emperor Tiberius, was one of the most celebrated jurists of his age. We learn from Tacitus that he put an end to his own life (*Ann.*, vi. 26).

Nerva is first mentioned in history as a favourite of Nero, who bestowed upon him triumphal honours, A.D. 66, when he was prætor elect. The poetry of Nerva, which is mentioned with praise by Pliny and Martial, appears to have recommended him to the favour of Nero. Nerva was employed in offices of trust and honour during the reigns of

Vespasian and Titus, but he incurred the suspicion of Domitian, and was banished by him to Tarentum.

On the assassination of Domitian on the 18th of September, A.D. 96, Nerva succeeded to the sovereign power, chiefly through the influence of Petronius Secundus, commander of the Prætorian cohorts, and of Parthenius, the chamberlain of the palace. The mild and equitable administration of Nerva is acknowledged and praised by all antient writers, and formed a striking contrast to the sanguinary rule of his predecessor. He discouraged all informers, recalled the exiles from banishment, relieved the people from some oppressive taxes, and granted toleration to the Christians. Many instances of his clemency and liberality are recorded by his contemporary the younger Pliny; he allowed no senator to be put to death during his reign, and practised the greatest economy in order to relieve the wants of the poorer citizens. But his impartial administration of justice met with little favour from the Prætorian cohorts, who had been allowed by Domitian to indulge in excesses of every kind. Enraged at the loss of their benefactor and favourite, they compelled Nerva to deliver into their hands Parthenius and their own commander Petronius, both of whom they put to death. The excesses of his own guards convinced Nerva that the government of the Roman empire required greater energy both of body and mind than he possessed; and he accordingly adopted Trajan as his successor, and associated him with himself in the government. Nerva died in the beginning of A.D. 98, after a reign of sixteen months and nine days. (Dion, lxviii. 4.)

(Dion; Aurelius Victor; Eutropius; the younger Pliny.)



Coin of Nerva.
British Museum. Actual size. Copper.

NERVE and NERVOUS SYSTEM. The nerves consist of fine tubular filaments of a white or greyish colour and of a peculiar substance, which are arranged nearly parallel to each other in sheaths of fibrous tissue, and which are more or less directly connected with the brain and spinal chord, from which as a centre they proceed in all directions to be distributed in the substance of nearly all the tissues of the body. The nervous filaments vary in diameter from $\frac{1}{1500}$ to about $\frac{1}{4000}$ of an inch, and each filament extends unbroken from the brain or spinal chord to the part in which it is distributed; the size of the nerves, that is, of the bundles contained in a common sheath or neurilema, depends on the number of filaments enclosed in each. In their course the nerves give off and receive numerous branches; in many parts their ramifications and connections are so numerous as to form a coarse kind of network or plexus; but in all these divisions and reunions there is no branching or communication of the ultimate filaments; the only change is that the filaments pass out of one sheath into another, and the only end that appears to be had in view is the more convenient passage of certain filaments to particular parts. *Fig.* 1 is a nerve, that is, a sheath containing a number of nervous filaments branching and receiving branches from another adjacent to it. *Fig.* 2 is a portion of nerve in which the sheath has been removed and the fibres and smaller fasciculi of filaments separated from each other.

Of the mode of termination of the nerves in the tissues little is distinctly known. In the retina [EYE] the nervous fibrils terminate in the small pointed processes by which the internal surface of that nervous expansion is beset; and it is very probable that a similar mode of termination exists in other analogous recipients of special sensation, and in the papillæ of the skin and mucous membranes; but for the nerves of the other tissues, whether the filaments unite in loops or form networks, or whether they terminate abruptly or gradually merge into the substance of the tissue in which they are placed, is at present undecided, the minuteness and obscurity of the objects having hitherto presented insuperable obstacles to certainty of microscopic observation.

Fig. 2.



Fig. 1.



On many parts the nerves bear ganglia—small rounded vascular masses of nervous matter, not arranged in fibres, but composed of globules scattered in a network of vessels. Nervous filaments enter into the ganglia on one side, and pass from them on the opposite, but they lose their filamentous character within them and appear to merge into the substance of the general mass.

The nerves are arranged in two systems, the cerebro-spinal, or nerves of animal life, and the ganglionic, or great sympathetic system, or nerves of organic life. The nerves of the first system are all immediately connected with the brain and spinal chord, and include all those which are the media of sensation and voluntary motion; the second system contains those nerves which are connected with the brain and spinal chord, or the nerves proceeding from them, only by very small filaments, which bear numerous ganglia in all parts of their course, and which are subservient to the actions of those parts which are engaged in the nutritive functions, and upon which the mind has in general no direct influence.

These two systems of nerves are developed together from almost the lowest animals. Nervous filaments have not yet been seen in the bodies of the polygastrica, nor in the porifera, nor in the polyp-bearing animals, though many of them are sensible to light and other impressions, and their motions indicate the agency of the same means as those which act in the higher animals. In those of the radiata in which distinct nerves are traceable, their distribution is circular, and hence the name of cyclo-neurose, often given to this class. A nervous circle is placed around the mouth, in a single or double cord, bearing minute ganglia, from which filaments radiate to the several divisions of the body, and especially to the tentacula and other moving or sensitive organs.

In the articulata, or diplo-neurose classes, the nervous system assumes the same lengthened form as the animals themselves possess. The same form of a nervous circle placed around the entrance to the digestive cavity is preserved, but the nerves proceeding from it are not all of equal length or similar in distribution as in the radiata, but

one much larger and more distinct than the rest is continued as a double cord, extended along the under surface of the body. The ganglion on the upper part of the nervous ring around the pharynx constitutes the first trace of a brain, from which in many genera nerves proceed to the antennæ, the eyes, &c. The cords or columns proceeding along the body are more or less approximated and often united to each other. Each is composed of two distinct tracts, on the lower of which there are ganglia over which the upper tracts pass without communicating with them; the lower ganglionic tract supplies the sensitive, the upper, not ganglionic, the motor nerves, a relation similar to that which exists in the vertebrata, if we allow for the generally inverted position of the organs in the articulata. Besides these tracts another is placed between the motor columns and the viscera, which has no connection with the ganglia, and whose nerves are principally distributed to the respiratory organs. The first trace of a distinct sympathetic system is found in a few nervous filaments passing off from the œsophageal ganglia and distributed around the dorsal artery and the adjacent viscera.

The size of the ganglia on the longitudinal cord of the articulata and of the nerves connecting them and given off from them is directly proportioned to the volume and complexity of the sensitive or motor organs adjacent to and supplied by each. Thus in those which exercise important motions and have their chief organs of sense about the head, the supra-œsophageal ganglion is very large, as in the rotifera and the complete insects; while in those in which the chief nervous influence is required for lateral limbs that ganglion is small, but the ganglia and cords along the whole or some particular part of the trunk are developed proportionally to the organs adjacent to them. In the higher genera of this class the nervous cords are contained in a cavity separate from that which encloses the other viscera, as they are also much more distinctly in all the vertebrata.

The most striking character in the nervous system of the preceding classes is the repetition of similar elements in the several similar parts of the animal. In both classes the animal is made up of a number of similar parts, which in the radiata are arranged round a common centre, and in the articulata are placed longitudinally. Each of these parts in both receives its nerves from a distinct ganglion, and therefore possesses to a certain extent an independent nervous system, and an independent life. In higher animals, in which particular portions of the body contain organs for special functions to be performed for the benefit of the whole, this repetition and equal distribution of central nervous organs no longer exists.

In the mollusca, or cyclo-gangliata, the nervous œsophageal ring is still present, and is often provided with numerous distinct ganglia, whose size bears a direct proportion to the organs of sensation placed near the mouth, and to the activity and complexity of the masticatory apparatus. The columns continued along the abdominal portion of the animal are usually, like itself, short; and except when active motions are performed by a foot or other locomotive organ, they bear but few and very small ganglia.

The nervous system of the mollusca is thus chiefly concentrated about the head, and its development is proportioned to that of the organs of sense and motion which are subservient to nutrition, while the nerves of the body are but little developed. In the articulata, on the other hand, in accordance with the greater proportionate development of their locomotive powers, the part of the nervous system belonging to the trunk becomes predominant. In the vertebrata, or spini-cerebrata, which possess both nutritive and locomotive powers more highly developed than either of the preceding classes, the types of both are united; the cerebral mass being a more highly developed form of the large supra-œsophageal ganglion of the higher mollusca, while the spinal chord, with the ganglia on its sensitive roots, corresponds with the long ganglionic cords of the articulata.

The most essential part of the nervous system of the vertebrata is the spinal chord, with its continuation in the cranium as far as the crura cerebri and cerebelli, and the ganglia formed upon them, which together constitute that which is termed the cerebro-spinal axis. This axis is always enclosed in an osseous sheath placed in the posterior part of the body, and it is never as in the invertebrata, traversed by the alimentary canal.

The sympathetic system of nerves distributed to the viscera, which in its simplest form, in the annelida, is composed of a few filaments from the supra-œsophageal ganglion, which pass along the dorsal artery, preserves in all the classes the same separation from the sensitive and motor cords, and the same general distribution about the viscera. It increases in complexity in the same degree as the cerebro-spinal system, and acquires in the vertebrata an extensive and still increasing development. It forms in the highest of them numerous and complicated plexuses, with many and some large ganglia, which follow the course of the principal blood-vessels, and are distributed to all the organs of organic life; it still communicates but little with the cerebro-spinal axis, sending only small filaments, which mingle with the spinal and some of the cerebral nerves near their roots.

The part of the nervous system of the vertebrata which is subject to most alteration is the brain. The chief differences in its form depend on the degree in which the hemispheres of the cerebrum and cerebellum are developed. In fishes these are usually smaller than the ganglia on the origin of the optic nerves; but ascending in the scale, they become more and more predominant in size over the rest of the nervous centres, and appear to have a certain relation to the development of intelligence in the animal. In the highest animals and in man the lobes of the cerebrum and cerebellum are by far the largest of all the nervous organs; their surfaces are convoluted and furrowed, the quantity of the grey matter upon them augmented, and the complexity of their structure greatly increased. But as a special article is devoted to this subject [BRAIN], it need not be further considered here; for similar reasons we shall here treat of only the general phenomena and laws of the actions of the nerves as they are observed in man, and the cerebro-spinal system only in reference to the nerves of common sensation and motion; referring for the description of the special senses to the articles EYE, EAR, &c., and for the peculiar influence of the nervous system in the most important organs, to the articles devoted to them. [HEART; STOMACH, &c.]

The constant functions of the cerebro-spinal nerves are, to convey impressions, made on the points in which they are distributed, to the brain, where they are perceived as sensations, or to the spinal chord, where they are perceived without sensation; and to convey the influence of the will from the brain, or some involuntary influence from it or the spinal chord, to the muscles by which some motion is to be performed. The influences that thus pass to and from the brain are conveyed through distinct nervous filaments, though the filaments subservient to each are generally enclosed in the same sheath, and appear to form a single and simple nerve. The filaments which convey impressions to the nervous centres are called sensitive or centripetal; while those conveying impressions from the centres to the muscles are named motor or centrifugal filaments.

The spinal chord, in which all the nerves of the trunk have their apparent origin, is composed of two lateral halves, symmetrical in form and size, and united together by a part of their inner surfaces at the median line. The outer portion of the chord is composed of white nervous matter, the inner of grey, an arrangement the reverse of that of the brain, in which the cortical substance is grey, and the medullary or central white. Each lateral half of the spinal chord is again obscurely divided by superficial furrows into an anterior and a posterior column, and a smaller middle portion between them. All the nerves by which sensitive impressions pass, arise from the groove between the posterior and middle columns; and all those (with the exception of the spinal accessory nerve [BRAIN]) by which the excitants to muscular motion are conveyed, arise from the groove between the anterior and middle columns. They all arise by what are called roots, that is, by a number of fine nervous threads or narrow bands attached to the grooves and passing for a short distance into the substance of the cord, which, as they proceed outwards, converge and unite into a single cord or nerve. There is an important distinction however between them; the roots of the posterior or sensitive nerves have a ganglion at their union just where they are leaving the vertebral canal, while those of the anterior or motor nerves unite without any ganglion into a single cord, which passes over, but does not communicate with the ganglion on the posterior roots. Beyond this ganglion the anterior and posterior roots unite in a common sheath, in which their filaments, though they continue distinct, are indiscriminately mixed; and in this manner they proceed through the varied branchings of the sheath to nearly all

parts of the body, conveying the power of perceiving impressions to all, and the power of motion to the muscles and probably a few other tissues.

Nearly the same mode of origin and distribution, and the same distinctness of office, are found in the nerves that have their centre in the brain, in which those of the fifth pair [BRAIN] are almost exactly analogous to the spinal nerves. But in the other cerebral nerves there is less regularity of origin, the nerves of peculiar sensation having no muscular nerves corresponding to them, the seventh nerve, or portio dura, being exclusively motor, without any corresponding sensitive root, &c. Thus of the nerves proceeding from the brain, some are in all their course sensitive only; others are (except for the occasional connection of some of their branches with branches of the fifth) entirely motor; others (part of those of the fifth) mixed, that is, containing in a common sheath both sensitive and motor filaments, like all the nerves derived from the spinal chord.

The conveyance of those impressions which produce common sensation is the property exclusively of those nervous filaments which arise from the posterior columns of the spinal chord and their continuations in the brain. To possess this power, their connection with the brain, either directly or through the medium of the spinal chord (which, in this view, may be regarded merely as a collection of a vast number of the nervous filaments, which have their centre in the brain), must remain uninjured. Hence, when any sensitive nerve is cut through, all the parts to which its filaments are distributed beyond the place of division are rendered perfectly insensible. The nearer to the brain that the injury is inflicted, the more extensive is the destruction of sensibility. When the spinal chord is injured by fracture of the vertebræ, or by disease, or any other means, all the parts whose nerves come out from the portion below that which is destroyed become insensible; they lose also all power of voluntary motion, but for the present we shall consider the sensitive filaments and their functions only. If the posterior roots of a nerve be divided, all the parts supplied by that nerve lose their sensibility; or if a nerve be divided in any part of its course, then all the parts supplied by branches given off between the point of division and the brain retain their sensibility, while those which are supplied by branches given off in the other part of the nerve more distant from the brain are rendered insensible. These facts prove that the influence of an impression upon the distal or peripheral extremity of a nervous filament can only be conveyed to the brain so as to produce sensation through a continuity of nervous tissue, and only through the very filaments that are impressed; and that there is no such communication of adjacent filaments, that if one is injured, another can convey the impression made on it, as in the circulation, by the anastomosis or communication of the blood-vessels, when one is obliterated, the blood which should traverse it passes through another. The same facts evidently explain also many of the phenomena of partial paralysis.

If that part of a divided nerve which is still connected with the brain be stimulated, the same sensation is perceived as if the stimulus were applied to all the parts in which the branches that the nerve gives off below the division are distributed. This is shown in the sensation which every one must have felt on striking the inside of the elbow (the *funny bone*, as it is commonly called); the tingling pain that the blow produces, and which appears to have its seat in the inner side of the fore-arm and hand, and in the little and ring fingers, is owing to the filaments of the ulnar nerve (which passes behind the elbow) being distributed to those parts, and to the sensation being always referred to the peripheral termination of the filament, in whatever part of its course it is irritated. It is of course impossible to experiment upon a single nervous filament, but the accuracy with which the imagined seat of sensation produced by irritating a bundle of filaments accords with their distribution leaves no doubt of the fact just mentioned. The nearer to the brain that the stimulus is applied, the more extended is the sensation; hence in disease of the spinal chord, pain is often felt in all the parts supplied with nerves coming off from the chord below the diseased portion, and the pain of dividing a nerve is felt over all the parts to which its branches are distributed. The same circumstance gives rise to the apparently strange ideas which those who have lost a limb entertain, that they still possess it, till by their sight or some other means they correct the erroneous impressions of their sense of touch. For example, the constant cry of a patient who has just lost his leg, while the stump is being dressed, is that his attendants are squeezing his knee, or cutting his foot, or injuring some other part of the limb, which he cannot believe has been cut off. The reason is, that when those filaments of the nerves in the stump which are destined for the knee are touched, the knee seems to be touched; when those which are going to the foot are injured, the foot appears to suffer. So deceptive are these sensations, that even years after the loss of a limb, or for the rest of their lives, persons occasionally endeavour to perform some act with the stump which they were accustomed to do with the part they have lost. From the same circumstance of the sameness of sensation, whatever be the part of a nervous filament to which the stimulus is applied, arises the well-known feeling of the foot having fallen asleep, when the ischiatic nerve has been pressed upon, and the peculiar character of the pain in many cases of tic doloureux, in which the trunk of a nerve being diseased, the pain is referred to all the parts to which its filaments are distributed.

The laws deduced from these facts, and which are of great importance in the explanation of many diseases of the nervous system, are briefly these. The impressions producing sensation always pass from the circumference of the distribution of the nerves to the centre; they are always centripetal, and their centre, the seat of sensation, is the brain. They can pass only through the tissue of the nervous filaments to which they have been applied, and whose connection with the brain must therefore be unimpaired. The sensation is the same on whatever part of the nervous filament the impression is first made, and it is always referred to the peripheral end of the filament.

If the connection of the nerve with the brain be broken, the same impression may pass along its filaments to the part where its continuity is destroyed, but it will produce no sensation; though when the spinal chord remains, its passage may be indicated by the phenomena of *reflex motion*, which will be presently considered. It is chiefly through the medium of the nerves of common sensation that we become acquainted with all that the contact of other palpable bodies teaches, as their form, size, hardness, heat, &c. For the perception of these properties we must suppose a peculiar condition of nervous matter; for although the laws under which impressions are conducted through all the sensitive nerves to the brain are the same, yet the nerves of peculiar sensation, as the optic [EYE] and the auditory [EAR] are no more capable of perceiving the impressions of contact of non-vibrating bodies, than the nerves of the limbs, &c. are of perceiving light and sound. If the retina be touched in an operation on the eye (as in the experiments which M. Magendie has often made in operating for cataract), the sensation produced is that of a brilliant flash of light; if the auditory nerve be electrified, the sensation is that of a sudden loud noise: but in neither case is pain produced, unless the nerves of common sensation, with which parts of the eye and ear are supplied, be irritated at the same time.

Our ideas of the form and size as well as of the hardness of bodies are dependent in some degree on another sense, which is peculiarly connected with the muscles [MUSCLE], and is called muscular sensibility. By it we know what degree and extent of muscular force we exert at any given time. Thus if the hand grasps a ball, we estimate its size by the degree in which the fingers are extended to enclose its circumference, for the mere impression of its contact on the fingers would be the same whether the ball were large or small; we estimate its weight by the muscular exertion which we feel it necessary to make to prevent it from falling; and its hardness by the degree of exertion which is sufficient or insufficient to make an impression on its exterior. In like manner, if the body be larger than the hand can grasp, then (unless we can see it) we estimate its size by the distance through which the hand moves in passing over the whole surface, and its form by the differences of position in which, in thus passing over it, the hand is from time to time placed. It is only the smaller differences in the form of the surfaces of bodies, their smoothness and roughness, and other similar characters, that are estimated by the touch alone. Thus when a sensitive part (as the hand) is placed or moved with a certain force on the surface of a body, we know that it is smooth if all the hand receives the same sensation, or rough if the sensation of contact is perceived at points distant from each other. In like manner, from

the extent of surface touched we form our ideas of the sharpness or obtuseness of bodies.

Perceptions of temperature are also the peculiar attributes of the nerves of common sensation, but they do not admit of our forming very accurate ideas of the heat of bodies, because our sensations depend rather on the rapidity with which heat is abstracted from or added to our bodies, than on the quantity which we lose or receive. Hence we feel marble, which conducts heat rapidly, as if it were much colder than a slowly-conducting carpet of the same temperature; and when the difference of temperature between the hand or any other part of the body and that which it touches is very great, we lose all power of judging, and cannot directly tell whether it is in contact with (for example) ice or boiling water. Peculiar states of the circulation in and around the nerves give rise to very different sensations of heat, as in fever or in shivering, in which, though the skin feels as if it were burning or freezing, the actual temperature of the surface does not in either case differ more than five or six degrees from that which is natural to it.

The acuteness of the common sensibility of parts probably depends, *cæteris paribus*, in the healthy state, on the closeness with which they are beset with the terminations of sensitive nervous filaments. E. H. Weber (*Annot. Anatom. et Phys.*) has suggested a mode of estimating the degrees of sensibility of different parts of the surface of the body by touching two adjacent points of it at the same instant, and observing at what distance from each other the two contacts can be discerned as two distinct impressions. This may be effected by putting small pieces of cork on the points of a pair of compasses, and pressing both at the same instant on the part to be examined; the angles which the legs of the compass form will thus measure the distances at which the two impressions are distinguished or are confounded into one. By this method of examination it is found that the tip of the tongue is the most sensible of all the surface of the body, being able to distinguish two impressions when the distance between the points on which they are applied is not more than $\frac{1}{20}$ of an inch, a result which might have been anticipated, from the accuracy with which the tongue perceives and estimates the characters of the smallest portions of foreign matter in the mouth, and from the great share which the sense of touch takes in what we confound in the general idea of taste. The balls of the fingers can distinguish double impressions from $\frac{1}{12}$ to $\frac{1}{4}$ of an inch apart; the palm at about half an inch, and other parts of the skin at various greater distances. Applied to the skin at the back of the neck, of the upper arm, the thigh, and some other parts, such double impressions are confounded into one when the points touched are upwards of two inches asunder.

Numerous circumstances have the power of modifying or increasing the sensibility of parts, giving rise to varieties of agreeable and painful sensations. Most parts moreover have certain sensations peculiar to themselves; thus no other tissue than the skin is ever the seat of the sensations of tickling, or itching, or burning heat, &c.; the muscles alone feel fatigue; the pain of disease in different tissues is as varied as any other of its phenomena. Certain parts also are insensible to any but particular impressions; the tendons and other similar tissues may be cut or burnt, or in any way injured without exciting any sensation, unless they are pulled or twisted, or subjected to any other of those mechanical influences which it is their office in the animal economy to resist. Other parts again, as most of the internal organs, the bones and cartilages, are insensible during health, but in disease excite severe and peculiar pain. For all these differences however no explanation is yet known. It is known that certain nerves (the motor) never, under any circumstances, convey sensible impressions; that others (the nerves of the sympathetic system) are, if ever, only occasionally conductors of sensations; that others (the nerves of the peculiar senses) convey only the impressions of those agents for the reception of which certain organs are peculiarly adapted; and that others have the constant office of conveying impressions of contact, heat, &c.; but upon what differences of structure or arrangement these varieties of function depend no reasonable opinion can at present be formed.

Many of the phenomena illustrative of the mode of conduction of the nervous influence in the sensitive nerves are repeated in the motor filaments, with this difference, that while in the sensitive nerves impressions always proceed from the circumference to the centre, or from the termination of the nervous filament in any tissue, to its termination in the brain or spinal cord; in the motor nerves the impressions always pass in the opposite direction, that is, from the centre to the circumference, or from the brain or spinal chord to the muscle or other contractile tissue. When the motor filaments of a nerve are irritated in any part of its course, no pain is felt, but the muscles to which it is distributed contract; when a similar nerve is cut through (or otherwise prevented from conveying the nervous influence), all the muscles to which the filaments that pass off from it, beyond the injured portion, are distributed, lose the power of being acted upon by the will, and very soon of being excited by any stimulus, while those from between the injured part and the brain retain their power. If the end of that portion of a divided motor nerve which is still connected with the nervous centre be irritated, no perceptible effect follows; if the end of the other portion, which is now separated from the brain, be irritated, the muscles to which its filaments proceed will for a time continue to contract. The same observations on the necessity of a continuity of nervous substance, on the absence of any communication between adjacent filaments, by which one might assume the office of another, and on the sameness of effect, whatever part of a nervous filament is irritated, may be made of the motor as of the sensitive filaments. As in by far the greater number of nerves, sensitive and motor filaments are contained within the same sheath, the phenomena, which have been described separately, will, in the case of injury or other affection of such nerves, be combined. Thus when the nerve of any limb is irritated, sudden pain is felt and coincident convulsions ensue; when a similar nerve is divided, the limb becomes both senseless and motionless; if the upper part of the divided nerve (that still connected with the brain) be irritated, pain is felt, but no motion is excited; if the lower part be irritated, convulsions of the limb take place, but no pain is felt.

Of the nature of the influence which, passing along the nerves, excites motion, and of the manner in which it is set in motion, nothing whatever is known. Through some nerves it can be transmitted at will, and the muscles supplied with these are therefore called voluntary; through others the will has no influence in sending the excitant to motion, and the involuntary muscles to which they pass are entirely removed from any connection with the mind, except in the excitement of violent passion or grief, or other exalted mental affection. Whatever stimulus is applied to the motor nerves, the same effect is produced; whether it be the stimulus of the will, or of any mechanical, chemical, or electrical application, the same muscular contraction, varying only in degree, is produced. The mind alone has the power of determining the strength and extent of muscular contraction, and this it effects by an operation which it scarcely appreciates; for even one who knows accurately the position and the mode of action of each muscle cannot, except in certain cases, order the act of a single muscle, but to produce a certain kind or strength of motion, is obliged to exert coincidently all the muscles that can minister to that motion. Thus there are two muscles, at least, that bend the fore-arm, and no person can make one of them act while the other remains inactive; the will can only determine certain effects, but it cannot determine the muscles by which they shall be accomplished.

In all the phenomena hitherto considered, the mind takes a part; but in some circumstances an impression passes along a sensitive nerve to the nervous centre, and although no sensation may have been produced, an influence is in return conveyed back from the centre through a motor nerve, and motion is produced, either in the muscles adjacent to the part first impressed, or in those of some other part of the body. The phenomena of this class are those of what is called the *reflex function*; a term which is derived from the idea that the impression, passing centripetally, is *reflected* from the centre as soon as it arrives there, and made to pass from it centrifugally.

For the occurrence of these reflex actions, it is essential that the nerves acted upon should retain their connection with the spinal chord or with the brain. The spinal chord is sufficient for some of these actions, and the power is therefore often spoken of as if it belonged exclusively to it; but it is evidently possessed by the whole cerebro-spinal axis. Thus, if the hind-leg of a reptile or any other animal be separated from the body, and the skin of any part of it

be irritated, no motion of its muscles will ensue; but if the leg be allowed to retain its connection with that part of the spinal chord from which its nerves come out, the same irritation of the skin will produce convulsive contractions of the muscles. In the first case the impression on the skin, if it passed along the sensitive nervous filaments at all, was lost at their outextremity; in the second, it passed through them to the spinal chord, and thence either it or some other influence returned immediately through the motor nerves to the muscles.

On this property of reflecting the impressions received from sensitive to motor nerves, many of the muscular motions which were formerly regarded as instinctive or sympathetic, and many others of the most important phenomena, depend. Thus when light falls on the retina, the impression received by the brain is instantly reflected through the third nerve, and the iris, without any effort of the will, contracts; and if the light be very strong and sudden, the eyelids involuntarily wince, as they do before any expected injury. In like manner a stimulus applied to the nose excites involuntary sneezing; food, or any other substance in the fauces or pharynx, excites the involuntary act of swallowing, and still more an irritation of the larynx is reflected from the medulla oblongata, and excites in all the respiratory muscles involuntary coughing. In all these cases sensation coexists with the reflection of the impression through the motor nerves; but sensation is by no means essential to the phenomena; on the contrary, in the most marked examples the centripetal impression is not perceived by the brain. Thus the sphincter muscles are constantly maintained in a state of contraction under the influence which passes unfelt from the spinal chord; and all the motions occurring in decapitated animals (in which the reflex actions are more remarkable than under any other circumstances) must probably be regarded as unaccompanied by sensation, since exactly similar phenomena occur in persons suffering from some forms of paralysis, and who can never feel the impression on the skin upon which the involuntary motions instantly follow. In the case of reflection from the optic nerve to the nerves of the iris, and in most of those in which the sensitive nerves pass directly to the brain, sensation is produced with the reflex action; but in all the cases where the centripetal nerves pass to the spinal chord, the reflex actions take place as well, or even more certainly, after the removal of the brain. The spinal chord is essential for a reflex action in the nerves that pass out from it; the brain for a similar action in its own nerves: in the first case sensation is not involved, in the second it generally is.

Mr. Grainger ('Observations on the Spinal Chord') believes that the impressions which produce reflex actions, and those which pass to and from the brain in sensation and voluntary motion, are not conveyed by the same sets of nervous fibres. He considers that there meet in the spinal chord four sets of nervous filaments: one passing only to the exterior white matter, and then ascending to the brain, to which they convey sensations; a second, corresponding to these, which pass from the brain along the exterior white matter of the chord, and thence to the muscles, for the conveyance of the influence of the will to them. These two sets are the same as the commonly described sensitive and motor filaments; the others are analogous to these, but are supposed to be subservient only to the reflex actions; they pass to and from the chord with the others, but instead of being continued up with them to the brain along the exterior of the chord, penetrate into its substance, and lose themselves in its central grey matter—the recipient and reflector of the impressions which they convey. The observations of the course of the filaments of the nerves, where they pass into the spinal chord, upon which this very ingenious view is founded, have not yet been sufficiently confirmed to establish its truth beyond doubt; but it still affords the most intelligible explanation of the manner in which impressions, passing apparently through the same filaments, in some cases produce sensation, and in others none; and in which, for certain purposes, organs supplied with nerves from the cerebro-spinal axis are yet usually removed from the influence of the brain.

It deserves particular remark, that in the cases in which the impression is conveyed only to the spinal chord, as in beheaded animals, the motions that result from the reflected influence, evince design. Thus when a bird's or any other lower animal's (as a frog's) head is cut off, the body endeavours to escape, and evinces method in its attempts; if a limb is touched, it is drawn away from the contact; if a part of the body is irritated, the foot will sometimes be raised in an endeavour to remove the source of irritation. These actions are similar to those of monsters born without brains, many of which have been known to cry, to take milk, and perform other apparently voluntary acts. Are we from these facts, indicating design in the actions of brainless animals, to believe that the spinal chord is capable of any exercise of will? Such an idea is very opposed to opinions which are deemed well founded, but is still far from groundless; the motions are scarcely otherwise explicable.

Of the nature of the agent which, passing along the nervous filaments, produces sensation or excites motion, nothing satisfactory is at present known. The imperceptible velocity of its passage naturally suggested the idea of an electric current, and except by the supposition of the motion, or the vibration of the particles of some such subtle material as electricity or the other imponderable agents are conceived to be, its velocity is scarcely to be accounted for. Some idea may be formed of its rapidity of passage along the nerves to and from the brain, by a rough calculation which the writer lately made, that when a person plays rapidly on the piano, upwards of 1000 distinct movements are performed within the minute; each of which has its time, place, and strength exactly ordered. At the same time that the mind imparts this number of impressions to the muscles, it is receiving not less than 2000 impressions by each of three distinct senses, the eye, the ear, and the touch, and perceives the most minute variations with each. From the similarity of this velocity of the nervous agent, to that of the passage of electricity, and from a few apparent analogies, some have imagined the nervous agent or fluid to be identical with the electric; but the grounds for such an opinion are at present few and uncertain, while many evident facts militate strongly against it, as the equal conducting power of all the moist tissues as well as the nervous; the improbability that electric fluid should be isolated in the filaments, the inconstancy of the results of experiments in which a current of electricity is used to replace a removed portion of a nerve, &c.

The nervous agent is prepared in the brain and spinal chord, and probably in all parts where there is ganglionic or grey nervous matter, and from them distributed to the nerves. Thus, if the trunk of a mixed nerve be divided, that part which is separated from the nervous centre soon loses that which may be called its stock of excitability, while that which remains attached to the centres retains its excitability as if no injury had been inflicted. For the maintenance of the excitability on which the reflex actions depend, the spinal chord alone seems to be necessary; for it is not more rapidly expended after the removal of the brain than when the brain is present. For the maintenance of the excitability for other actions the brain is essential.

Each impression made on the sensitive nerves, and each excitant to motion, may be considered to cause a certain consumption of the nervous influence, which it is the office of the nervous centres to replace; and a healthy condition of the nervous system may reasonably be conceived to depend on a due proportion between the waste and the supply. When the former has been excessive, weakness or fatigue of the senses, or of the power of muscular motion, is produced, which a period of sleep or rest from excitement is necessary to replace. The necessity of such rest is indicated to us by the fatigue at the close of each day, and cannot long be safely resisted; for after the loss of the night's rest, the excitant necessary to produce a certain effect is found to become greater in a rapidly increasing ratio through every hour of the succeeding day. During rest, the brain may be considered as producing the excitability by which the nerves may act during the period of exertion; and hence exertion is not less necessary for health than rest; and many disorders show that excitability may, for want of being wasted by exertion, accumulate. Hence much of that which passes under the popular name of nervousness—a condition in which a given excitant produces a greater effect than is natural or healthy; and this (although the use of terms usually applied to material things may give too definite an idea of it) we may reasonably believe to result from an accumulation of nervous influence, as fatigue, or the need of a greater excitement to produce a certain effect, results from its waste. The influence of exercise of

the nerves follows the same rule as that of exercise of the muscles or any other tissue; by it, within certain limits, the power of perceiving impressions and of exciting motion is progressively increased; the excitability of each organ or of the whole system being, within those limits, capable of adaptation to the need of the individual; hence the power by practice of attaining to perfection of touch, or of hearing, or sight, or any other sense. Impressions are distinctly felt by the practised sense which are completely imperceptible to that which has been only casually employed. In like manner, when the organ of one sense is destroyed, and thus one outlet for excitability is closed, the rest acquire increased acuteness; hence the accuracy of the hearing and touch in the blind, of the sight in the deaf, &c.

The system of the great sympathetic nerve is that whose branches are distributed to all the organs of organic life, the heart, lungs, digestive canal and glands, &c., chiefly following the course of the blood-vessels, bearing numerous and large ganglia in all parts of their course, and communicating with the brain and spinal chord or their nerves only by few and small filaments. The parts to which the branches of the sympathetic nerve are distributed have but vague if any sensibility, unless under peculiar circumstances of disease; and the motions which some of them possess are usually quite independent of the mind. Numerous experiments of irritating the ganglia of the sympathetic to see whether it produces pain, have had unsatisfactory results; nor would any results of apparent insensibility be conclusive, because the ganglia might, like part of the brain, be insensible to injury, though fully capable of perceiving the impressions transmitted to them through their nerves. But the pain of the diseases of internal organs is amply sufficient to prove their sensibility, though it does not determine whether the impression of pain is conveyed through filaments of the sympathetic system or through those few of the cerebro-spinal system which are mingled with the former in the common sheath. In the same manner, in extraordinary cases, the brain and spinal chord have an evident influence on the motions of the organs supplied by the sympathetic nerve, as in the effects of strong passion and other mental affections on the circulation, the digestive functions, &c. The impressions conveyed from the viscera to the brain and spinal chord may also be reflected either to the voluntary muscles, as in the convulsions of children with disordered digestion, or to the involuntary muscles, as in the increased rapidity of pulse, the sickness, &c. which occur in various diseases.

In the natural state however, the organs chiefly supplied by the sympathetic nerves are entirely independent of the cerebro-spinal system, and will maintain their actions for a time even after their removal from the body. Thus the peristaltic motion of the intestines, the contractions and dilatations of the heart of some animals, and some other similar actions, will continue for a considerable time after they are separated from the body, or after all the nerves passing to them have been divided. Many other facts prove also that the internal organs are much less dependent on the influence of the sympathetic nerve than the external animal organs are on that of their cerebro-spinal nerves: severe irritation of the sympathetic nerves, such as, if applied to the cerebro-spinal motor nerves, would excite sudden and violent convulsions of their muscles, gives rise to but weak and slow contractions of the viscera; and these follow at perceptible intervals after the application of the stimulus, so that it is often difficult to say whether the irritation have exerted any influence at all.

The office of the numerous ganglia placed in the course of the sympathetic nerves is perhaps the most obscure point in the whole range of physiology. Some have regarded them as so many brains, by which impressions are received through the branches of which each ganglion is the centre, and from which excitements to motion are sent out; others have believed that they exercise a power of isolating the organs they supply from the influence of the mind or of obstructing the constant passage of impressions to and from the brain; and many other functions have been supposed to be performed by them: but for each and all the evidence is altogether unsatisfactory.

The sympathetic nerve or system of nerves has received its name from the idea that it is of ultimate importance in the phenomena of what is called sympathy, in which one part of the body is affected in consequence of some peculiar condition of another. A great number of the phenomena which were formerly regarded as the effects of sympathy are now more clearly explained by the reflecting action of the cerebro-spinal axis; many others depend on some generally operating influence, as a peculiar condition of the blood, &c.; and in those that remain it is questionable whether the sympathetic system of nerves exercises any peculiar power. The universality of its distribution among the viscera is the only ground on which it can be believed to possess this property of exciting impressions or actions in one, in consequence of being itself excited by the condition of another.

It exerts a more evident influence in the various secretions of the glands and other surfaces which it supplies. In some instances the excitant to secretion is conveyed primarily from the brain, either directly, as in the flowing of tears in grief, &c., or by a reflex action, as in the tears that flow when the mucous membrane of the nose is irritated, or as in the flow of saliva in a strong irritation of the membrane of the mouth, in the sweating of fear or of great agony, &c. In the more constant secretions the influence of the sympathetic nerves is in some degree assumed; but there are sufficient facts to prove that their injury is very soon followed by a suppression or modification of the secretion in the organ to which the injured nerves are destined. The cerebro-spinal nerves also exercise an influence on the secretion and nutrition of the parts which they supply; but its amount is indistinct, in consequence of the interruption of other circumstances favourable to those processes, by the same injury which cuts off the secretory power of the nerves, as the loss of exercise of the muscles, &c.

The best general account of the physiology of the nerves is in Müller's 'Physiologie,' translated by Dr. Baly; for all that relates to the distinct functions of the roots of the nerves, the several works of Sir Charles Bell (by whom this most important discovery was first made) may be consulted, and with them the physiological treatises of Mr. Mayo and M. Magendie. On the reflex actions, the best works are, Prochaska's 'Physiologie,' in which it is first distinctly announced, though long before alluded to by Glisson (*Tract. de Ventriculo et Intestinio*), and the works of Dr. Marshall Hall, by whom the subject has been most fully illustrated and raised to its just importance, and of Mr. Grainger and Dr. Volkmann. The electrical theory of the nervous fluid is most extensively illustrated in the writings of Dr. Wilson Philip. The best account in English of the comparative anatomy of the nervous system will be found in Dr. Grant's 'Outlines of Comparative Anatomy.'

NE'SEA. Lamouroux gives this name to some of the articulated Corallines.

NESS, LOCH, is a lake in Scotland, situated between 57° 10′ and 57° 27′ N. lat. and between 4° 20 and 4° 40′ W. long. It is 22 miles long: its breadth varies from a mile and a quarter to three-quarters of a mile. It extends south-south-west and north-north-east over a considerable portion of Glenmore, through which the Caledonian Canal passes. The depth of the water is from 106 to 129 fathoms in the middle parts; but near the ends of the lake it decreases to 85, 75, and much less. At the north-east end the depth is reduced to 7 and 9 fathoms. This lake is never covered with ice. At its south-western extremity it receives the waters of the small river Oich, which issues from Loch Oich, which lies farther south. From its north-eastern extremity issues the river Ness, which, after a course of six miles, discharges its waters into Moray Frith. Loch Ness is enclosed on both sides by lofty, rugged, steep, and barren mountains, which attain an average height of 1000 feet. The highest mountain-masses are on the western shore and near the middle of the lake, where they rise in the huge summit of the Mealfourvouny. This mountain is stated to be 2730 feet high, but it is probably higher, if the fact be true that not far from its summit there is a small lake which is always frozen. On the north and south of this enormous mass of rocks two pastoral glens open upon the lake, Glen Urquhart and Glen Morison, and the rivers which drain them bring a large quantity of water to the lake. The mountains south and north of these two glens are much less elevated: this is also the case with the rocks which skirt the eastern shores of the lake. These rocks are cut by deep gullies and frightful precipices, and the rivers Farrigag and Feachloin rush violently into the lake through two narrow fissures. These rivers drain Strath Erick, a pastoral valley, which is more than 400 feet above the level

of the sea, and extends parallel to the lake for about fifteen miles. It is a beautiful tract of country, and its charms are increased by the cataracts of Foyers or Fyers, which the river Feachloin forms in breaking through the line of elevated rocks which divide the strath from the lake. It rivals in beauty the waterfalls of the Clyde and of the Tumel.

(*Parliamentary Reports on the Caledonian Canal*; Sinclair's *Statistical Account of Scotland*; and MacCulloch's *Highlands and Western Islands*.)

NESTOR (Ornithology). [PSITTACIDÆ.]

NESTORIANS, the name of an important and early sect of Christians, which is derived from Nestorius, a Syrian by birth, who became patriarch of Constantinople in 428, under the reign of Theodosius II. He showed himself very zealous against the Arians and other sectarians; but after some time a priest of Antioch, named Anastasius, who had followed Nestorius to Constantinople, began to preach that there were two persons in Jesus Christ, and that the Word, or divinity, had not become man, but had descended upon the man Jesus, born of the Virgin Mary, and that the two natures became morally united as it were, but not hypostatically joined into one person; and that when Jesus died it was the human person and not the divinity that suffered. This doctrine, being not only not discountenanced, but supported by Nestorius, was the origin of the Nestorian schism. Nestorius refused to allow to the Virgin Mary the title of Theotokos, or mother of God, but allowed her that of Christotokos, or mother of Christ. Nestorius met with numerous opponents, among others Eusebius of Dorylæum; and the controversy occasioned great disturbances in Constantinople. Cyril, bishop of Alexandria in Egypt, with his characteristic violence, anathematised Nestorius, who in his turn anathematised Cyril, whom he accused of degrading the divine nature and making it subject to the infirmities of the human nature. [CYRIL OF ALEXANDRIA.] The emperor Theodosius convoked a general council at Ephesus to decide upon the question, A.D. 431. The council, which was attended by 210 bishops, condemned the doctrine of Nestorius, who refused to appear before the council, as many Eastern bishops, and John of Antioch among the rest, had not yet arrived. Upon this the council deposed Nestorius. Soon after John of Antioch and his friends came, and condemned Cyril as being guilty of the Apollinarian heresy. The emperor, being appealed to by both parties, after some hesitation, sent for Nestorius and Cyril, but it appears that he was displeased with what he considered pride and obstinacy in Nestorius, and confined him to a monastery. But as his name was still a rallying word for faction, Theodosius banished him to the deserts of Thebais in Egypt, where he died. His partisans however spread over the East, and have continued to this day to form a separate church, which is rather numerous, especially in Mesopotamia, where their patriarch resides at Diarbekr.

The Nestorians at one time spread into Persia, and from thence to the coast of Coromandel, where the Portuguese found a community of them at St. Thomé, but they persecuted them and obliged them to turn Roman Catholics.

(*Histoire du Nestorianisme*, by Father Doucin, a Jesuit, 1698; and a *Dissertation on the Syrian Nestorians*, in the 4th volume of the *Bibliotheca Orientalis* of J. S. Assemani.)

Eutyches, in his zeal to oppose the Nestorians, fell into the opposite extreme of saying that there was only one nature in Christ, namely, the divine nature, by which the human nature had become absorbed. [EUTYCHIANS.]

NETHERLANDS, THE. This kingdom as now constituted consists of the territory of the antient republic of the Seven United Provinces and of some portions of the province of Limburg, but not including the grand-duchy of Luxemburg, which the king of the Netherlands possesses, with the title of grand-duke, as a part of the German Confederation. The kingdom of the Netherlands is situated between 50° 41′ and 53° 34′ N. lat. and 3° 30′ and 7° 10′ E. long. It is bounded on the east by Germany, on the north and west by the German Ocean or North Sea, and on the south by Belgium. The frontier line which divides it from Belgium is described in the article BELGIUM, as fixed by the treaty of 15th November, 1831, which has now been accepted and ratified by both parties. The area of the kingdom is about 11,000 square miles; the population, on the 1st of January, 1839, was 2,583,271. [The] kingdom is now divided into ten provinces:—

	Area. Sq. miles.	Population.
North Brabant . .	1,942	366,160
Guelderland . .	2,000	336,401
North Holland . .	930	423,873
South Holland . .	1,170	509,661
Zealand	640	145,542
Utrecht	525	140,574
Friesland . . .	1,027	227,415
Overyssel . . .	1,240	191,062
Groningen . . .	770	172,437
Drenthe . . .	920	70,146
Total . . .	11,164	2,583,271

That part of Limburg (with 147,527 inhabitants) which is restored to the kingdom of the Netherlands is annexed in perpetuity to that crown, but is constituted as *the duchy of Limburg*, and is to form a part of the German confederation, in lieu of that part of Luxemburg which the German diet consents to cede to Belgium; but Maestricht and Venloo remain an integral part of the kingdom of the Netherlands.

Face of the Country; Soil; Climate.—The Netherlands are part of the great plain of Northern Europe, and are not separated from Germany on the north-east by any natural boundaries. The provinces about the mouths of the Schelde and the Rhine, and the country to the north of them, Zealand, North and South Holland, Friesland, Groningen, Drenthe, and Overyssel, are indeed most appropriately called the Netherlands, that is, the Lowlands. They form one unbroken flat without a hill or rock, without forests or running waters, they lie in part even below the level of the sea, against the inroads of which they are protected partly by immense dikes, and partly by sandhills or *dunes* from 80 to 180 feet high, which have been cast up by the ocean, and, running parallel with the coast, protect it against the element to which they owe their origin. Nothing can be more dreary than this ocean of sand; it is a perfect image of aridity and barrenness; some broom scarcely green, some stunted shrubs growing at intervals in the hollows, where they are protected from the wind, alone interrupt this dreary solitude. From the Helder to the mouth of the Maas, a distance of 75 miles, these gloomy though protecting deserts everywhere extend between the cultivated country and the sea. The land thus rescued from the sea, consisting of moor and mud, is traversed by numberless canals, which are absolutely necessary to drain it and render it fit for cultivation. The labour is amply rewarded, for the land is extremely fertile and covered with the richest pastures. The lowest parts are called polders. When a marsh is to be drained, it is first enclosed with a rampart or dike to prevent any water from flowing into it. Windmills are then erected on the edge of the dike, each of which works a pump. As the mills raise the water, it is discharged into a canal, which conveys it to the sea or to some inland piece of water. But in general the operation cannot be performed at once; where the marshes are too deep below the surrounding country, two or three dikes and as many canals are made at different levels, rising by degrees to the upper canal, in which the whole terminates. The girdle of windmills, which announces at a distance the position of the polder, has the appearance of sentinels placed to guard the entrance. All the polders have an extremely rich slimy soil, which is generally used for pasturage, but in some places produces rich crops of corn. The eastern provinces nearest to Germany contain many meres and marshes, and especially the great series of turf moors which extend from the mouth of the Schelde eastward to the Maas, and there join the great morass called the Peel, on the east frontier of North Brabant, which is 10 leagues long and from 1 to 3 leagues broad.

This marshy country, which is so wholly artificial that it has justly been said 'the Dutch built Holland,' is one of the best cultivated, the most wealthy, and the most populous in Europe; and it would be difficult to find elsewhere, in so small a compass, such a number of large and well-built villages, towns, and cities. The atmosphere in these low tracts is for the most part damp, thick, and heavy; fogs and storms are very frequent; but both the heat and the cold are more moderate than in Northern Germany. The climate is unhealthy, especially for foreigners. The want of good spring water is very sensibly felt. The climate is more healthy in the eastern provinces, which are rather more

elevated, and contain some hills, which the inhabitants dignify with the name of mountains.

Bays, Rivers, Canals, and Lakes.—The whole coast, which is much broken and indented with considerable bays, large inlets of the sea, and the mouths of great rivers, would measure near 500 miles, or about 1 mile of coast for every 22 square miles. The German Ocean, or North Sea, which borders Belgium and the Netherlands from the frontier of France, a few miles east of Dunkirk, to the mouth of the Ems, has produced in the lapse of ages great physical revolutions in the maritime provinces. The most remarkable of these revolutions have been the retreat and encroachment of the sea, and the changes in the course of the Rhine. The whole country probably once belonged to the ocean, but the oldest accounts that we possess represent the land as more extensive than at present. The Yssel, it appears, ran into an inland lake called Flevo, from which a river pursued its course for fifty miles to the sea. That lake, with the adjacent continent, has been covered for many centuries by the Zuyder Zee, the only remains of the continent being the islands of Texel, Vlieland, Schelling, and Ameland, which lie in a curved line, convex towards the ocean, in front of and protecting the entrance of the Zuyder Zee. This inland sea, which is enclosed by the islands and the provinces of Holland, Utrecht, Guelderland, Overyssel, and Friesland, resembles a great lake: it is 80 miles long from north to south, and its breadth varies from 20 to 30 and 40 miles. On account of its great extent, the navigation is dangerous in stormy weather for small vessels, which however cross it from South Holland to Friesland rather than go all round the coast. The entrances between the islands being much obstructed by sand-banks, the trade of Amsterdam derives infinite benefits from that noble work the North Holland Canal. The Lauwer Zee, between Friesland and Groningen, and the Dollart, between Groningen and the German province of East Friesland, were formed by similar irruptions of the sea in the thirteenth century; and so late as the fifteenth century a great salt-water lake, called the Bies Bosch, was suddenly formed to the south-east of Dort, by the sea bursting through a dam and overwhelming 72 villages, with 100,000 inhabitants.

The principal river is the Rhine, which, coming from Germany, enters the Netherlands at Lobith, where it is 2300 feet broad; but in traversing this country it is divided into three arms, and before it reaches the sea even loses its venerable name. Soon after crossing the frontier it divides into two branches, the larger and left arm forming the Waal. The right or northern arm flows to Arnheim, where it again divides into two branches; one, called the Yssel, flows northwards to the Zuyder Zee; the other runs to Wijk, where it again divides into two streams, the larger, called the Leck, joining the Waal above Rotterdam, and the smaller, now reduced to an insignificant river, passing by Utrecht to Leyden and the sea. Till the beginning of this century, this branch was lost in the sand, the mouth being completely choked up; in 1804 works were commenced to re-open this mouth of the river near Katwyck, and the operation was happily completed in 1807. The other principal rivers are, the Maas, Maese, or Meuse, which comes from Belgium, and joins the Waal at the fort of St. Andries; and the Schelde, which, likewise coming from Belgium, enters Holland below Antwerp, and divides into two arms, the East and the West Schelde; the West Schelde falls into the ocean at Flushing, and the East Schelde between the Zealand islands of Schouwen and North Beveland. Of the canals the most important is the North or Helder Canal. [HOLLAND, *North.*] The greatest lake is that of Haarlem, which it has now been resolved to drain. [HAARLEM.]

Natural Productions.—The horses, which are a large strong breed, well adapted for draught and for heavy cavalry, are about 200,000 in number. The horned cattle are mostly remarkable for their size and beauty, and amount to about a million. Vast numbers of lean cattle from Denmark and Germany are fattened in the rich pastures of North Holland. There are about 700,000 sheep. The swine are of the German breed, and are most numerous in the provinces next to Germany. The only kind of game is hares, which are rare; wild rabbits however are very numerous among the sand-hills. Domestic poultry is plentiful. There are wild geese and ducks, snipes, woodcocks, and plovers. This is the paradise of storks, it being considered a great offence to kill one. Accordingly they build their nests on the house-tops, and walk about unmolested and unconcerned. Fish is abundant on the coasts and in the rivers; the cod fishery on the Doggerbank and the Greenland whale fishery are very productive. But the herring fishery on the coast of the Shetland islands, formerly a chief source of the wealth of the Dutch, has greatly declined. In 1601 there were 1500 vessels employed in the herring fishery; in the years from 1795 to 1807 and 1808 there were only 30; but the number has since increased to nearly 200.

Sufficient corn for home consumption is not raised; hemp and flax are grown in great abundance.

There are no minerals, except a little bog-iron in Overyssel and Guelderland: there are brick-earth and potters' clay in most of the provinces. Fullers' earth (but mixed with too much sand) is got in pretty considerable quantities about Tilburg; and immense quantities of turf are dug in Holland and Friesland: some sea-salt, but in small quantities, is made on the coasts of Holland and Friesland.

Trade.—The history of the commerce of the Netherlands properly begins with Bruges in Flanders, in the fourteenth century. From Bruges the trade was for the most part transferred at the end of the fifteenth century to Antwerp, which became the greatest emporium in the world. But the ravages of the war with Spain and the capture of the city after the memorable siege in 1585 drove the wealthiest inhabitants to the northern provinces, especially to Amsterdam. The new republic of the 'Seven United Provinces,' founded on principles of civil and religious liberty, became a sure asylum for the oppressed, while religious dissentions and persecutions prevailed in many other parts of Europe. Poor as the country then was in natural resources, it was necessary to find for the rapidly increasing population employment beyond the seas. The republicans, who were at first driven by necessity to become bold corsairs against the Spanish squadrons, soon became excellent and intrepid seamen, and enterprising indefatigable merchants, who traversed every sea, for whom no source of gain was too remote, and to whom no obstacle was insurmountable. The commerce of Antwerp, Cadiz, and Lisbon fell into their hands, and thus, in the middle of the seventeenth century, the United Provinces became the first commercial state and the greatest maritime power in the world, and the trade of Amsterdam acquired an unparalleled degree of prosperity. The East India Company, founded in 1602, with a capital of only 6,500,000 florins, conquered kingdoms and islands in Asia. With 200 ships it traded with China and Japan; it alone furnished Europe with the costly productions of the Spice Islands; the gold, the pearls, and the diamonds of the East passed only through its hands. The prosperity of Amsterdam remained almost unimpaired till towards the latter end of the eighteenth century, when the French revolution in 1795 gave it the death-blow, and its rival, London, became the commercial capital of the world. Reduced to the condition of a vassal and afterwards of a province of France, and consequently engaged in a constant war with England, Holland lost its ships, its colonies, its commerce, and its public credit. After recovering its independence on the expulsion of the French in 1813, the commerce of Holland revived in a remarkable manner, but is still very far below its former magnitude. During the union of the northern and southern provinces, under the name of the kingdom of the Netherlands, both Holland and Belgium flourished. Holland indeed lost the colonies of Berbice, Demerara, and Essequibo, with the Cape of Good Hope and Ceylon. The very profitable contraband trade formerly carried on with Spanish America has also been destroyed, since those colonies declared themselves independent. The trade with India has undergone a great change, not only by the loss of the Cape and Ceylon, but by the fall of the East India Company and the throwing open of the East India trade to all the subjects of the Netherlands, excepting that to the Moluccas and to Japan. On the other hand the improved administration of Java has led to a vast increase of the productions of that fine colony, and new and profitable channels have been opened to Dutch commerce in Brazil, Cuba, and Haiti. The precarious state of affairs from the time of the revolt of the southern provinces in 1830 till the confirmation of their independence by the treaty of peace concluded in April last (1839), was certainly a great check to the progress of commerce; yet it continued to improve even during that period, and there is little doubt that it will again become very flourishing, and more so perhaps than during the union with Belgium.

The following official tables, for the year 1837, show:—I. The number of ships cleared inwards, to what countries they belonged, how many to each country, and their tonnage. II. At what ports in Holland they arrived, how many at each port, and how many under the flag of the Netherlands. III. From what countries they came; how many from each country, and how many under the Netherlands flag. IV. How many ships cleared outwards, and under what flags:—

Ships cleared Inwards.

Table I.

Of what Nation.	Ships.	Tons.	Ballast.
Netherlands .	2721	313,982	(7051)
English . .	1191	199,602	
North American	73	20,366	
Portuguese .	3	171	
French . .	9	15,221	
Russian . .	54	9,724	
Swedish . .	51	7,598	
Norwegian .	472	101,188	
Danish . .	247	18,940	
Prussian . .	86	16,874	
Hanoverian .	496	24,950	
Mecklenburg .	70	11,665	
Oldenburg .	95	3,841	
Lübeck . .	5	971	
Bremen . .	9	2,135	
Hamburg . .	6	711	
Rostock . .	3	447	
Papenburg .	2	105	
Kniphuisen .	98	7,688	
Austrian . .	2	580	
Sardinian .	1	250	
Sicilian . .	2	307	
Spanish . .	2	113	
Neapolitan .	3	678	
Total .	5787	753,105	

Table II.

Arrived at	Ships.	Neth. Flag.
Amsterdam . .	1987	875
Minden . .	5	5
Zaandam . .	151	82
Enkhuizen .	3	2
Medemblik . .	38	3
Edam . .	120	90
Monnikendam .	32	28
Alkmaar . .	45	35
Helder . .	20	14
Tornhilling . .	8	2
Quomenudo .	68	7
Brielle . .	6	..
Maassluis . .	10	10
Helvoetsluys .	3	1
Rotterdam . .	1439	393
Delfshaven . .	8	6
Schiedam . .	145	80
Vlaardingen .	58	55
Dordrecht . .	244	110
Vliessingen (Flushing)	30	14
Veere . .	1	1
Zierekzee . .	4	1
Brouwershaven .	4	1
Middelburg .	36	13
Lemmer . .	17	17
Workam . .	68	68
Harlingen . .	431	229
Dockum . .	26	25
Kampen . .	5	5
Zwelle . .	30	27
Delfzyl . .	282	208
Termunterzyl .	176	102
Groningen . .	236	165
Oude Pekelet .	26	17
Langlekkerschans	9	3
Zoltkamp . .	28	27
Total .	5787	272

Table III.

From what Countries.	Ships.	Neth. Flag.
The Kleine Oost, Mecklenburg, and Lübeck	444	228
Hanover . .	694	276
Denmark . .	111	29
Prussia . . .	370	343
Russia . . .	444	261
Sweden and Norway	1161	654
Great Britain . .	1665	476
France . . .	307	177
Portugal . .	69	13
Spain . . .	20	12
Italy . . .	43	23
Levant, Egypt, and Barbary	18	10
Canaries, Azores, and Cape Verd	2	2
Guinea Coast . .	1	..
Cape and East Indies	142	130
China . . .	2	2
South America and West Ocean	18	17
Curaçoa . .	6	5
Brazil . .	15	6
Berbice and Demerara	4	4
Surinam . .	71	70
North America .	174	37
Greenland and Davis Straits	1	1
Total .	5787	2721

IV. *Ships cleared Outwards.*—5784 ships, 776,300 tons with cargoes—3526 ships, 497,174 tons; the remainder in ballast. Dutch flag, 2720 ships, 327,481 tons. English, 1200 ships, 202,807 tons. North America, 65 ships, 20,598 tons. French, 94 ships, 14,462 tons. Norway, 463 ships, 100,589 tons. Denmark, 242 ships, 13,692 tons. Hanover, 492 ships, 26,230 tons.

Of which there were bound to Great Britain, 1692 ships, 83,769 tons; Russia, 239 ships; Denmark, 104 ships; Sweden and Norway, 1095 ships, 153,524 tons; Cape and East Indies, 135 ships, 72,032 tons.

The inland trade employs 5600 of the vessels called trekschuyts, and 15,000 boats.

The exports consist, 1st, of colonial produce from the East and West Indies, coffee, sugar, spices, tea, silks, and other articles from China and Japan; and 2nd, chiefly of the productions of the country, among which they export to England annually 18 million pounds of butter and 27 million pounds of cheese; likewise flax, hemp, and corn, where the importation is permitted; tobacco, madder, flower-roots (especially hyacinths and tulips), cattle, and horses: 3rd, the produce of their fisheries, especially herrings, and of their distilleries and manufactories. The chief articles of importation are corn, salt, wine, timber in very large quantities, partly from Norway and partly from Germany, whence it is floated down the Rhine; stone, such as blocks of granite from Norway for the dikes, and freestone for building; marble, and various manufactured goods; besides colonial produce of every kind from the possessions in Asia, Africa, and the West Indies. After the separation of the seven provinces from Spain, the Dutch, in the seventeenth century, held in their hands the greater portion of the carrying trade of Europe, and Holland was a general magazine of the productions of all countries; at that time a list of its exports and imports would have been an encyclopædia of merchandise; and though this cannot be now said, it is still true in a great degree.

Manufactures.—The principal manufactures are, linen of the very best quality; woollens, once the most celebrated in the world; silks, and leather. The sugar refineries have increased of late years in a very extraordinary degree. Tobacco-pipes are made in large quantities, both for home consumption and exportation. The distilleries of Geneva, or Hollands, of which there are 200 at Schiedam, have long been celebrated. It is remarkable that the distillers last year petitioned the government for a reduction of the excise-duty, on the ground that their exportation to the United States of North America has greatly diminished in consequence of the establishment of Temperance Societies in that country. Since the revolt of the Belgian provinces in 1830, great efforts have been made to establish manufactures, especially of cottons, in the northern provinces, which appear to have been very successful; so that in a few years the kingdom of the Netherlands, as now constituted, may probably be placed in the rank of manufacturing as well as commercial nations.

Religion.—The established religion is Calvinism, or, as it is called, the Reformed religion; but a general toleration has so long prevailed, that religious sects of almost every kind enjoy the free exercise of their own forms of worship. The exact proportions at this moment have not been published, but in 1837 it was estimated that there were—Calvinists, 1,700,000; Lutherans, 357,000; Mennonites, 120,000; Remonstrants, or Arminians, 40,000; Anabaptists, 2500; some other Christian sects, 15,000; Roman Catholics, 280,000; and Jews, 50,000. The proportions have probably not much altered since.

Education is very generally diffused throughout the kingdom. Besides the parish schools, under the protection of the government, private boarding-schools are as numerous as in England. No person is allowed to set up a school without a licence, which he cannot obtain without a previous examination by a special commission. There are four classes of licences, according to the branches of education to be taught; and no person is permitted to undertake a higher branch than that for which he has passed his examination. For the higher branches there are seminaries, called Royal Schools, where the antient and modern languages, mathematics, rhetoric, and drawing are taught; of these there is one in every large town. The universities are those of Leyden, Utrecht, and Groningen, the first of which was formerly one of the most illustrious in Europe, and can boast a long and splendid list of learned men who have been educated within its walls. There are likewise schools for particular branches of education, such as military and naval schools.

The *Constitution* of the kingdom of the Netherlands is contained in the *Grond Wet*, or fundamental law of the kingdom of the Netherlands, promulgated by a royal ordinance of 24th August, 1815. This constitution resembles in many particulars that of Great Britain. The crown is hereditary in the male line, and, in default of male descendants, in the female line. The executive power is in the hands of the king, whose person is inviolable, his ministers being responsible. The legislative power is in the king and the states-general, consisting of two chambers: the members of the first chamber are appointed by the king for their life; the second chamber is elected by the provincial assemblies, and one-third of the members go out annually by rotation, but they may be re-elected. All new laws are proposed by the king to the second chamber. The sittings of the second chamber are open to the public; those of the first are not. Each province has its own provincial assembly, which has various important local duties, such as the superintendence of religious worship and charitable institutions, the care of the roads and bridges, and the election of the deputies to the second chamber. This constitution, having been made for the kingdom of the Netherlands as constituted in 1815, is to undergo various alterations and modifications, in consequence of the separation of the northern and southern provinces.

Finances.—This is a subject of extreme intricacy, rendered still more complex by the union with Belgium, and the precarious state of the country, which was neither at war nor at peace with Belgium, after the revolt of the latter in 1830, till the final separation of the two countries. The whole must be amply discussed in the present session of the states-general. We can here only state that the budget presented by the minister of finance on the 25th of October, 1839, proposes an expenditure for the year 1840 of 56,378,600 florins, of which 21½ millions are for the interest of the national debt, above 14 millions for the army, and 5½ millions for the navy. The ways and means are estimated at 56,386,298 florins. One of the items worth notice in the ways and means is the sum of 11,220,000 florins from the revenues of the colonies.

Army and Navy.—The amount and the organization of the army cannot at present be fully known. A very great reduction has already been made since the peace by disbanding the militia and volunteers. The navy consists of about eighty vessels, of which twelve are ships of the line. These are however of lower rates than in the British navy, there being only one 90-gun ship.

Colonies.—The Dutch still possess many important colonies: in Asia—Java, Amboyna, Banda, Ternate, Macassar, and settlements in Sumatra, Borneo, and Coromandel; in Africa, thirteen forts on the coast of Guinea; in the West Indies, the islands of Curaçao, St. Eustatius, and part of St. Martin, and, on the continent of South America, Surinam, and a right to send stores and receive produce from Demerara, Essequibo, and Berbice, formerly their colonies, but now in the possession of Great Britain.

History.—Julius Cæsar, in prosecuting his conquests in Northern Gaul, advanced as far as the Rhine. The inhabitants of the north bank of the Rhine were called Batavi, and considered as belonging to Germany. They were engaged in many wars, either with the Romans, or as their allies. We afterwards find them partly as trading, partly as seafaring people, and as pirates, who were in the end subdued by the Romans. In the fifth century the Batavians, and in the sixth the Belgæ, were conquered by the Franks, but the Frieslanders not till the seventh century. At the peace of Verdun, in 843, Batavia and Friesland were incorporated with the newly created kingdom of Germany, of which Ludwig (*i.e.* Lewis), surnamed the German, was the first king, and were under governors, who afterwards made themselves independent. From the year 1000 to the end of the eleventh century, the country was divided into duchies, counties, and imperial cities. Utrecht became a bishopric, and extended its temporal power over Groningen and Overyssel. Of all these princes the counts of Flanders were the most powerful, and their country having become subject, in 1383, to the still more powerful house of Burgundy, the latter made itself master of almost the whole of the Netherlands. Charles the Bold, the last duke of Burgundy, fell in a battle with the Swiss, and his only daughter and heiress Maria marrying Maximilian, son of Frederick III., duke of Austria, and emperor of Germany, the Netherlands came under the dominion of the house of Austria. Maximilian's grandson, Charles V., by the Pragmatic Sanction in 1548, united all the seventeen provinces for ever with Spain; they however retained the name of the circle of Burgundy, and were attached to the German empire. During the reign of Charles V., the Protestant religion began to spread in these provinces, though grievously oppressed, for the number of persons in the seventeen provinces put to death in his reign as heretics is estimated at several thousands. His son and successor Philip II. not only deviated from the policy of his father, who had respected the antient liberties of the people, but introduced the Inquisition, and carried on religious persecution with a cruelty before unknown. The patience of the people was exhausted, and they rose in open rebellion, which the atrocities of the bloodthirsty Alba could not quell. The heads of the noblest of the nation, among whom were Egmont and Horn, fell indeed under the axe of the executioner. The prince of Orange, who escaped, long maintained an unequal combat, and though often defeated by Don John of Austria and Alexander duke of Paris, at length triumphed in the cause of liberty and the Protestant religion.

The struggle would certainly have been sooner and more easily ended, but for the jealousies between the several provinces and the nobles, and the unfortunate reciprocal distrust of the Protestants and the Roman Catholics. It is true that almost all the other provinces concluded with Holland and Zealand, the convention of Ghent, in 1576, and formed a still closer alliance in the following year, by the Union of Brussels. But the consummate abilities of the prince of Parma succeeded in bringing all the southern provinces under the authority of Spain. In 1579 the five provinces of Holland, Zealand, Utrecht, Guelderland, and Friesland concluded the celebrated Union of Utrecht, in which they declared themselves independent of Spain. They were joined in 1580 by Overyssel. On the 26th July, 1581, they renounced their allegiance to Philip 'as a tyrant,' and being joined in 1594 by Groningen, formed the celebrated republic of the Seven United Provinces, which was afterwards generally called Holland, from that province, which exceeded the others in extent, population, wealth, and influence. Though Philip III. was obliged to conclude, in 1609, a thirteen years' truce, called the peace of Antwerp, and the independence of the provinces was recognised by all the European powers except Spain, it was not fully secured till the peace of Münster, at the close of the Thirty Years' War, in 1648. Towards the end of the seventeenth century, they were engaged in war with France and England, and at the beginning of the eighteenth century, in the war of the Spanish succession. Holland was weakened by these efforts, while republican jealousy of the attempts of the House of Orange to increase its authority sowed the seeds of party rage and civil war. In 1747 the House of Orange triumphed, and William IV. obtained the hereditary dignity of stadtholder in all the seven provinces. In 1786 the republicans again raised their heads, but the wife of the

stadtholder William V., who was sister to Frederic William II., king of Prussia, having been insulted by some violent patriots, applied to her brother, who sent a Prussian army of 25,000 men to avenge the indignity she had received, and secure the rights of her husband. The patriots resisted in vain; the rights of the House of Orange were confirmed and enlarged, and a close alliance concluded between the republic and Great Britain and Prussia. In 1794 the republican or Anti-Orange party, encouraged by the approach of the victorious armies of France, again rose. Pichegru easily conquered Holland, being favoured by the severe winter and by the popular party, and the stadtholder, with his family, was obliged to fly to England. The provinces were now organised under the title of the Batavian Republic. A necessary consequence of this change was war with England, which led to the capture of their fleets, the destruction of their trade, and the loss of their colonies, to all which evils were added the exorbitant demands of their French allies, who also changed several times the constitution of the republic. In 1806, it was formed by Napoleon into a kingdom, and given to his brother Louis, who studied the welfare of his subjects, but lost the friendship of his brother after the landing of the English, and unexpectedly resigned the crown in favour of his eldest son, a minor, on the 1st of July, 1810. Napoleon however refused to recognise his brother's arrangement, and incorporated the kingdom with the French empire, with which it remained united till November, 1813, when the people, encouraged by the disasters of the French, rose and expelled them from the country, and recalled the Orange family. The Prince landed from England on the 30th of November, 1813, and was welcomed with a delirium of joy which seemed to be marvellous in so cool and phlegmatic a people. The prince governed the country by the title of 'Sovereign Prince,' till 1815, when the seven northern and the ten southern provinces, after a separation of two hundred years, were again united, by the name of the Kingdom of the Netherlands, a grand and noble conception, destined to accomplish the object which England had so long attempted,—the union of all the provinces in one independent state, calculated to serve as a real barrier against France. This union continued for fifteen years, to the advantage of both countries, and especially of the Belgians, who however were not satisfied with the new state of things. In 1830, encouraged by the Revolution which had expelled Charles X. and his family from France, they revolted from their allegiance, and claimed to become an independent state distinct from Holland. This end they have at length attained, not however without the aid of France and England. The independence of Belgium is secured by the treaty concluded in April, 1839, which is guaranteed by Great Britain, France, Austria, Russia, and Prussia.

Literature, &c.—It is not a little remarkable, that of a people whose shores lie opposite our own, and whose national character likewise runs in many respects parallel with ours, who have been animated by a similar spirit of industry, commercial enterprise, and maritime ardour—even the language should be hardly at all known in this country, notwithstanding the study of it is calculated to throw so much light upon our own, which has not only the same common origin, but has immediately borrowed a great number of words and expressions from it. So far from meriting that contempt with which the insolence of ignorance has branded them, there are few nations which have contributed more towards the civilisation of Europe, and to learning and science, than the people of the Netherlands. The country that has produced an Erasmus and a Grotius, a Swammerdam, a Leeuwenhoek, and a Boerhaave; that has done so much for the physical sciences, for medicine, jurisprudence, philology, classical and oriental literature; that can boast of such writers as a Vondel, and in our times a Bilderdijk; that has done so much for the cultivation of its language; that possesses so many literary societies and institutes, together with others for the encouragement of the fine arts,—ought not to be stigmatised as one inhabited by a dull plodding race of merchants. One circumstance, which, if it has served to diffuse over Europe the labours of its learned men, has also merged their celebrity in that of continental literature generally, has been the practice of employing Latin, a circumstance which has rendered an acquaintance with the Dutch language unnecessary for the purpose of profiting by their studies or their discoveries. Most probably too the universal celebrity of the Dutch scholars throughout the learned world has in no small degree tended to divert attention from and excite a prejudice against the vernacular language and literature, as being rude and uncultivated, and unfitted for any nobler purpose than that of carrying on the intercourse of daily life. Yet so very far is this from being the case, that there is scarcely any modern tongue which either contains within itself more plastic elements or which has been more carefully wrought up and polished; nor have any people paid greater attention to purity of style and elegance of diction than the writers of Holland of late years. It cannot be said that the difficulty of acquiring it has deterred us from attempting to form any acquaintance with the literature of this country; because, of all foreign idioms, it is that which bears the strongest family resemblance to our own—so much so, that flippant and ignorant travellers have sometimes described it as a sort of bastard English, which is just as correct as it would be for a Hollander to call English a bastard jargon of Dutch. Those who have picked up a few commonplace phrases, and decide that the language in which Vondel wrote is a barbarous one, would be capable of pronouncing with equal effrontery that the language employed by Milton is altogether rude and unpolished, if they judged of it only as they could make out what was said to them by innkeepers and postillions. It certainly has its defects, but they are those of our own language, which sounds equally harsh to Southern ears, and is condemned as being clogged with consonants and abounding in monosyllables.* At the same time it possesses far greater homogeneousness, and, like the German, the power of combining out of its own elements and roots that class of words which we borrow immediately from the Latin and the Greek; for instance, *onnavolgbare*, 'inimitable,' *vereeningen*, 'to unite,' *veelomvattende*, 'comprehensive,' &c.; whereas we have only a very few of the kind, such as 'unchangeable,' wherein the Saxon root is employed. Hardly indeed is an Englishman a fair judge in such a case, because, while familiarity with them blinds him to the deficiencies and imperfections of his own language, his prejudices are shocked by one which is at once so similar and so unlike his native tongue. An Italian would be a more impartial umpire, inasmuch as he would have no particular prepossession in favour of either. We do not say that the literature of the Dutch language contains so much to reward the student as that of Germany, but it certainly contains a very great deal, and much too that is equally or even more worthy of finding translators in this country than many of the productions which have been imported from Germany into our own literary market; and by way of specifying at least something rather recent worthy of appearing in an English dress, we may mention the 'Plinius Secundus' and the 'Messala Corvinus' of Van Hall. There is indeed a current of sound and healthy feeling in the literature of Holland, which, but for our extravagant prejudices, would have recommended it to the sympathies of our countrymen. That devotional fervour and that regard for the hallowing influences of domestic life, together with nobleness and independence of spirit, which pervade so many of the higher poetical productions of that country, would at least, it might be imagined, secure them some attention among ourselves.

After indulging in the preceding remarks, it may perhaps be deemed somewhat inconsistent to say that we cannot attempt to give anything like a connected historical summary of the literature; yet though our limits prevent us from doing this, we have considered it important to correct popular prejudices against the subject itself, since by so doing, and pointing to it as one of considerable interest, we are likely to direct further inquiry more serviceably than by merely stating a few facts.

Although they now stand in somewhat the same degree of relationship to each other as the English and Scotch, the Dutch and Flemish languages were originally the same; the difference between them has been occasioned by that of the northern provinces having been cultivated and refined and employed in literature, while the other has continued almost stationary in its primitive rudeness. Even in the twelfth century the Dutch began to be used in public decrees and civil acts; nor was it long before writers arose

* As one instance at least that even in poetry an entire verse of monosyllables is not necessarily either rugged or poor, we may be allowed to quote a line of Darwin's, which is perhaps one of the most sonorous and energetic in our language—

'Cleaves the dark air, and asks no star but thee!'

who began to mould it into rhythm, if not always into poetry. Contemporary with our Roger Bacon, Jacob van Maerlant (1235-1300), who has been called the Father of the Poets of the Netherlands, may be said to have preceded Chaucer by an entire century, as the latter lived from 1328 to 1400. His most celebrated productions are his 'Rijmbibel' and 'Spiegel Historiael' (or Historic Mirror). Neither was he the only writer in the language of that age; for Melis Stoke, Jan van Heln, Thomas van Ghessaert, Heijnric van Holland, and others of less note, belong to the same century. In the following one sprung up the literary societies known by the name of the 'Kamers der Rederijkers,' or 'Chambers of Rhetoric,' but which, so far from advancing poetry, rather corrupted the language itself; besides which, the party and civil dissensions that prevailed during the 14th and 15th centuries were exceedingly unfavourable to the progress of literature. It was in the last-mentioned period however that Holland distinguished itself by two most important inventions, that of oil-painting and that of printing. It is true that as regards printing rival claims to those of Haarlem in behalf of Laurenco Koster have been made by both Mainz and Strasburg in favour of Guttenberg; but if even Koning's work on the subject has not completely established the former, neither are the arguments hitherto adduced to the contrary sufficient to completely invalidate them.

Of the services of Erasmus both to letters and to religious liberty, or of the share which Holland took in the Reformation, it is not our purpose to speak; neither can we bestow any notice on those writers of the 16th century who obtained celebrity by works of erudition or science. The period we now arrive at may be considered as not merely the dawn but the morning of Dutch literature; and one of the first who contributed towards purifying and refining the native tongue was Dirk Volkertzoon Koornhert, who was born at Amsterdam in 1522, and became private secretary to the States of Holland in 1572. Among other contemporary names of note appear those of Philip van Marnix, Peter Heijns, Spieghel, and Roemer-Visscher. The last-mentioned has been styled the Martial of Holland, but he is now chiefly indebted for celebrity to the fame of his daughters Anna and Maria, who, on account both of their learning and poetical talents, obtained the title of the 'Dutch Muses.' By the end of the century a new generation had begun to spring up, who not only greatly surpassed all their predecessors, but suddenly advanced both the language and literature in an extraordinary degree. The æra from the commencement of the seventeenth century to 1679, the time of Vondel's death, comprises some of the most illustrious names in the literary annals of Holland—those of Hooft, Cats, Decker, Kamphuysen, Anslo, and Antonides van der Goes. Referring to the respective articles in this 'Cyclopædia' for some biographical account of the three first-mentioned, we shall briefly sum up their literary merits. It is difficult to decide whether the prose or the poetical compositions of Hooft did most for the refinement of the language. His versification is particularly fluent and melodious, and, as far as his own talent is concerned, his poetry may deserve the preference; yet, by cultivating a prose style, he furnished a model which was then most wanted. Together with Vondel, he may be considered the chief founder of the Dutch tragic theatre. Of Cats it is difficult to comprise an adequate eulogium in a few words; yet, if ever there was a truly national and popular writer—one who has addressed himself to all the best feelings of his countrymen—one whose works are prized by all classes for whom he wrote—that writer is 'Father Cats.' The popularity which his works enjoy is as honourable to the character of his countrymen as to his own fame, for a vein of morality, benevolence, and strong religious principle runs through them all. If Decker's poems are not of the highest class on account of their subjects, they exhibit superior talent, and contributed very much to the improvement of the language. Kamphuysen's productions display great poetical power, both in regard to the ideas and the expression, and his religious pieces breathe intense devotional ardour. Reinier Anslo was greatly admired in his own time and praised for his talents by Vondel himself; and even now his poems may be perused with interest, especially his 'Pest tot Napels' (or Plague at Naples), the horrors of which are described by him with great power.

Before we come to speak of Vondel himself, there are several names which it would be unjust to pass by wholly in silence, although they did comparatively little for the native literature of their country, their reputation being based chiefly upon their Latin productions. Huig de Groot, Dan. Heins, Kasper van Baerle, may seem strangely obscure names, but those of Grotius, Heinsius, and Barlæus are certainly—the first two at least—of European celebrity. Constantine Huijgens was not one of the least gifted or least remarkable writers of this period, since nearly all his productions are stamped by originality both of thought and expression. He was employed upon missions to various courts, and came over to this country on one to Charles II., and afterwards, although then greatly advanced in years, visited Italy, chiefly for the purpose of beholding Vaucluse. Jan Vos, originally a glazier at Amsterdam, where he was born in 1620, was a man of some ability as a dramatic writer, but his taste was by no means equal to his talent, for his 'Aran en Titus' and his 'Medea' are filled with extravagances; yet his versification is masterly, and some of his comic pieces possess strong humour. The two daughters of Roemer-Visscher have already been named, but some few particulars relative to them may be acceptable. Anna, the elder of them, was highly esteemed both by Cats and by Grotius, the latter of whom translated into Latin her poem on his escape from prison. Maria, the younger, and by far the more gifted, was not only one of the most learned, but one of the most accomplished females of the age, nor was she less admirable for the excellence of her disposition. She enjoyed the friendship of Hooft, Vondel, Huijgens, and other eminent literary men. Her poems have much merit, and a translation by her of Tasso's 'Jerusalem' was greatly extolled by her friends, but appears to have been never completed nor published.

Referring for fuller particulars to the article VONDEL, we can now merely take a glance at one of whom Holland has just cause to be proud, for never has poetic genius displayed itself more forcibly or with greater sublimity than it does in all his best productions. He was one of those superior spirits who give celebrity to their country and to their age; and if Camoens singly has sufficed for the literary glory of Portugal, Vondel alone would be sufficient to confer fame upon the land which, if it did not actually give him birth—for he was born at Cologne—was that which reared and cherished him. His tragedies are confessedly his master-pieces, not that they exhibit much of dramatic quality, of action, character, and passion, but rather on account of the lofty strains with which they abound, more especially in the chorusses, they being all moulded upon the ancient model, and some of them, such as his 'Lucifer,' 'Adam in Ballingschap,' 'Abraham,' 'Jephtha,' not at all adapted to the stage, on account of their subjects. They therefore may be characterised rather as dramatic oratorios without music than as dramas. Among his productions of this class his 'Lucifer' stands pre-eminent, and has given rise to comparison between the genius of Vondel and that of Milton; it may therefore be proper to observe that it preceded 'Paradise Lost' by fourteen years. As may be supposed from what has above been said, his odes and lyrical pieces abound in beauties; but he was scarcely inferior as a satirical poet, in which character however he displays far more of the spirit of Juvenal than of Horace. Defects avoided by far inferior writers may be detected in all his productions, but his merits are of first-rate order.

Jan Antonisz, or Antonides van der Goes, who belongs not only to Vondel's time, but also to his school, having been his friend and pupil, was gifted with great power of imagination, and his 'Ijstroom' is considered one of the best descriptive poems in the language. Of his two friends Dirk Buysero and Jan Pluymer, the former was rather the patron of literature than a writer by profession, but he wrote several dramatic pieces; the latter was director of the theatre at Amsterdam, and author of 'Ines de Castro' and some other tragedies.

Towards the close of the seventeenth century, French literature began to find imitators, and for a short time originality was checked. Vollenhove, another literary friend of Vondel's, author of the sacred poem entitled the 'Kruistriomf' (or Triumph of the Cross) and of some miscellaneous poems (1686), was still living; as was likewise Lucas Rotgans, who had produced an epic poem, of which our own William III. was the subject, and two tragedies, which have been highly extolled by Van Effen. Elisabeth Hoofman, or, according to her marriage

name, Koolaert, may be included among the writers of this century, having been born in 1664. This lady would deserve notice were it only as one of the most learned women not only of her own but of almost any age or country. In her sixteenth year she made translations from Anacreon and Horace; and was so well skilled in Latin as to compose several poems in that language, while her ability in her own is proved by that entitled the 'Schowburg der Verwoesting,' in which she eloquently moralises on the transitoriness of all worldly grandeur, and of which the versification is no less smooth and flowing than the ideas and images are striking.

The first half of the eighteenth century was marked by the productions of Van Effen and those of Poot, Hoogvliet, Schim, Feitama, De Marre, Steenwijk, and Langendijk. Scarcely to any one is the prose literature of Holland more indebted than to Justus van Effen, who has, without any great exaggeration, been styled the Dutch Addison, not only as being a distinguished essay-writer, but on account of the terseness and elegance of his style. His 'Hollandsche Spectator' has deservedly taken its place as a classical work in the language, as a model both of style and correct taste. Hubert Corneliszoon Poot was another writer of much originality and talent, and obtained great popularity by his comic poetical tales, which, like those of Wieland, are chiefly founded upon mythological subjects. Arnold Hoogvliet, on the contrary, took a higher flight: he aspired to the sacred epic, and took for his subject the history of Abraham. Notwithstanding its defects, this poem displays genuine talent; the versification is masterly, and many of the descriptions and other passages both powerfully and finely touched. He had also previously distinguished himself by a clever translation of Ovid's 'Fasti.' Hendrik Schim was also a writer of religious poetry, viz. 'Bijbel-poesie,' 1723; 'Bijbel en Zededichtn,' 1726; and 'Heerlijkheid van Christus,' 1731, &c. If not gifted with superior talent, Sybrand Feitama was a poet of most extraordinary patience and perseverance, for he spent upwards of thirty years upon his translation of Fénélon's 'Telemachus' into verse, and full twenty more on that of the 'Henriade.' In his own day his reputation was very considerable, nor was it wholly undeserved, for he certainly did much towards perfecting the mechanical part of poetry. He also produced two tragedies, 'Titus Vespasianus,' and 'Romulus,' besides translations of eleven others from the French, of which language he was a great admirer.

Jan de Marre, a seaman by profession, who, upon his return from a voyage to the East Indies in 1731, was appointed superintendent of the public buildings at Amsterdam, contributed to the Dutch stage one of its best and most popular tragedies, namely, 'Jacoba van Beijeren.' He also wrote a poem in six books entitled 'Batavia,' besides a variety of miscellaneous pieces. Peter Boddaert, a jurisconsult, antiquary, and secretary to the admiralty, obtained repute as a writer of religious and moral poetry, and also adapted Crebillon's 'Thyestes' to the Dutch stage. Frans von Steenwijk, the pupil of Feitama, published in 1748 his religious heroic poem of 'Gideon,' the plan of which is greatly superior to the execution, if we except the style and versification. Almost about the same time, viz. 1752, another poem of the same class, on the subject of the patriarch Jacob, was produced by Frederick Duim, who also wrote several pieces of religious poetry. Peter Langendijk, originally a damask-weaver by trade, was one of the principal comic dramatic writers of this period; and that he possessed a natural genius for comedy can hardly be denied, when it is known that his 'Don Quixote,' which is still a stock-piece of the Dutch stage, was composed by him at the age of sixteen, though afterwards considerably improved. His 'Alexander the Great,' in which a countryman is served as Christopher Sly was, and made to believe, on waking, that he is the Macedonian hero, is highly comic, though defective from its want of interest in the plot. He also wrote several humourous poems and parodies—rather coarse in taste, among which may be mentioned 'Æneas in his Sunday Coat.' Dirk Smits, author of an excellent imitation of Pope's 'Eloisa to Abelard,' was, if not a forcible, a pleasing poet in his original compositions, which are chiefly of the lyric class. His friend Adrian van der Vliet wrote pastoral poetry.

Coming to those who, for convenience sake, may be considered as another generation, for some of them might with equal propriety have been introduced above, we have now to pass in review the writers who fall within the latter half of the eighteenth century, reserving till afterwards such as have distinguished themselves chiefly in the present. The first names to be mentioned are those of William and Onno van Haren, two brothers of noble family, whose productions make an epoch in the poetical literature of their country, by their originality and spirit, which stamp them as of a quite different class from the school of Feitama. The 'Friso' of William van Haren is a romantic epopœia, founded upon old chronicles and legends of Friesland, and full of adventures, the scene of which commences in India. This poem has, with many defects, many striking beauties also, many interesting scenes and episodes, much graphic description, and further contains many noble sentiments and moral reflections. William van Haren also distinguished himself as a lyric poet; but considerable as his talents were, they were greatly surpassed by those of his brother. Onno Zweier van Haren filled, at various times, many high posts in the state, but his highest title to fame now rests upon his 'Geuzen' (first published in 1769, under the title of 'Het Vaderland'), which is not so much an epic as a cycle of national poems celebrating the leading events in the history of the Netherlands. Upon the whole, this production is the chef-d'œuvre of the Dutch literature in the eighteenth century. It has gone through many editions, one of which was edited with a volume of commentaries, by Bilderdijk, in 1826. Lucretia Wilhelmina van Merken, or Madame van Winter, the most distinguished female poet of the century, acquired great reputation by her 'David' and her 'Germanicus,' the latter of which is said by De Vries to be greatly superior to the other, while a contrary opinion is expressed by Van Kampen, who remarks that there is more of poetic power in the touches of Tacitus. Her husband Nicolaas Simon van Winter was also a poet of considerable ability, who published a collection of fables and other pieces, two tragedies, and 'De Jaargetyden' (1769), an imitation of Thomson's 'Seasons.'

Like Madame van Winter, Jan Nomsz attempted epic, choosing for his hero William I., but with inferior success: in his tragedies he displayed more talent. His 'Ledige Uuren' (Leisure Hours) establish Lucas Trip's claim to notice as a writer of religious and moral poetry; in which class of subjects his friend Johannes Eusebius Voet (who was by profession a physician) likewise distinguished himself.

If we could here speak of him as fully as he merits, Bellamy would detain us for some time, for he was not only a genuine poet, but he gave a fresher and more energetic tone to Dutch literature, and was almost the very first who ventured to shake off rhyme. Admiration of his genius is not lessened by knowing that until rescued from that situation by the liberality of other patrons, who took the charge of his education, he was originally apprenticed to a baker; or that what he actually did was only the promise of what he would have done, had he not been cut off when scarcely twenty-eight years old. Bellamy's is perhaps the only poetry which the Germans have transplanted from the literature of Holland into their own.

About the same time that his country lost the no less amiable than highly gifted Bellamy, it also lost, in the Baroness Cornelia Juliana De Lannoy, an accomplished woman, whose tragedies are extolled by De Vries as very superior to any similar productions by her contemporaries. Kastelyn, who was a man of considerable attainments in chemistry, distinguished himself also in poetry, especially by his didactic poem called 'Geloof aan de Voorzienigheid' (Trust in Providence), in which there is a tone of tender melancholy and resignation that recommends it to those who, like himself, have been schooled in affliction. Of Nieuwland [NIEUWLAND] we shall here only observe that he was scarcely inferior to Bellamy, while he resembled him in many of the circumstances of his life, its premature end not excepted. His poetical talents constitute but a small share of Van Alphen's claim to fame, for as a moralist, a philosopher, and a critic, he was no less distinguished. Admirable in themselves, his Cantatas have the further merit of being the first productions of the kind in the language, and are still unrivalled in it.

The two attached friends Elizabeth Bekker (Wolff) and Agatha Deken, both of whom died on the same day, may be considered as the first who introduced the modern novel into Holland, their productions of which class were eminently successful, and some of them were translated into German. Petronilla Moens was another female author in the same branch of literature, but she possessed less truth to nature. In the drama and likewise in history and biography, Simon

Stijl was a popular writer, more especially in the last-mentioned class of composition. Peter Leonard van de Kasteele, the pensionary of Haarlem, and Van Alphen's friend, showed considerable poetical talent, both by his original compositions, chiefly on religious and devotional subjects, and his translations from Klopstock and Wieland, besides his version of Ossian in hexameter verse. As a humourous and satiric writer, Arend Fokke stands without a rival in the language, and is styled by Van Kampen the Callot and Hogarth of Dutch literature, a distinction to which he is well entitled by his 'Boertige Reize' (Comic Journey through Europe), his 'Ironical Comic Dictionary,' &c.; while his 'Catechisms of the Arts and Sciences,' in 11 vols., show him to have been also a man of solid and extensive information.

Rhynvis Feith, Helmers, and Bilderdijk, are writers of whom any country might be proud. Both as a poet and as a critic, Feith is entitled to admiration. His 'Grave' (which first appeared in 1792, and has been translated into German), is a masterly production, with equal beauties and perhaps fewer defects than Young's 'Night Thoughts.' His 'Thirza,' 'Lady Jane Grey,' and 'Iñez de Castro,' exhibit his powers as a tragic poet; while his 'Letters,' his 'Essay on Heroic Poetry,' &c. place him in a high rank as a prose writer. Helmers, a merchant by profession, affords a striking proof that the pursuits of commerce are not uncongenial to or incompatible with those of literature and taste, since, apart from their other merits, his poems breathe the most noble and generous sentiments, and are replete with striking ideas and imagery. Of Bilderdijk, one whose varied powers exhibited themselves with equal success upon the most opposite subjects, to attempt to speak here appears almost an injustice, since we have no space even to particularise any of his numerous productions, except it be to express regret that so fine a poem as his 'Ondergang der eersten Wereld' (the Destruction of the first World) should never have been continued beyond the fifth book. Kinker, who, though born in 1764, is, we believe, yet living, is another excellent poet, and has produced admirable translations of Schiller's 'Maid of Orleans' and 'Lady Jane Grey.' Loots, Loorjes, Tollens, Immerzeel, Van Hall, Da Costa, Van Lennep, all of them still or till very lately living, are writers who do honour to the literature of their country, which has recently lost in Van Kampen its historian, one to whose labours we are indebted for much of the information contained in this article, or rather which is here merely pointed at. To those who care for more than the necessarily imperfect outline of the subject here presented to them, we can recommend Van Kampen's 'Beknopte Geschiedenis der Letteren,' &c. as a most interesting guide in the study of the literature of the Netherlands; nor does he confine himself to the literature alone, but takes a view of all that his countrymen have achieved in every branch of science; and if territorial extent, and we may add population, can be taken as a standard in such matters, the Netherlands have certainly contributed infinitely more than their share towards the general civilization and enlightenment of Europe.

The table here appended, which might have been made much more complete, will be useful as a chronological map, wherein are supplied, as far as authority for them could be found, those dates which are not mentioned in this brief historical sketch. It is arranged according to the dates of the deaths.

	Born.	Died.
Brederode .	1585	1618
Roemer-Visscher .		1620
Kamphuyzen .		1626
Groot, Huig de (Grotius)	1583	1645
Hooft, Pet. Corn. .	1581	1647
Roemer-Visscher, Maria	1594	1649
——— Anna	1584	1651
Heinse, Dan. (Heinsius)	1580	1655
Brune, Jan de .	1585	1658
Cats, Jacob .	1577	1660
Van der Veen .		1660
Dekker, Jeremias .	1610	1666
Anslo, Reinier .	1622	1669
Vondel, Joost van .	1587	1679
Antonides von der Goes, Jan	1647	1684
Brandt, Gerard .	1626	1685
Huygens, Constantine	1596	1686
Broekhuizen, Jan .	1649	1707
Vollenhove, Jan .	1631	1708
Rotgans, Lucas .	1645	1710
Poot, Hubert Corn. .	1689	1733
Van Effen, Justus .	1684	1735
Hoogvliet, Arnold .	1687	1735
Schim, Hendrik .	1695	1742
Smits, Dirk .	1702	1752
Boddaert, Peter .	1694	1760
Marre, Jan de .	1696	1763
Feitama, Sybrand .	1694	176*
Steenwijk, Frans .		1772
Voet, J. Eusebius .		1778
Van Haren, Willem	1710	
——— Onno .	1713	1779
Nomsz, Jan .		1779
Van der Vliet .	1702	1780
De Lannoy, Jul. Cornelia	1738	1782
Trip, Lucas .	1712	1783
Bellamy, Jacob .	1758	1786
Kasteleyn .	1750	1793
Nieuwland, Peter .	1764	1794
{Van Merken, Lucretia	1722	
{Van Winter .	1718	1795
Bakker, Huizinga .	1718	1801
Van Alphen .	1746	1803
Bekker, Eliz. .	1738	1804
Deken, Agatha .		1804
Stijl, Simon .	1731	1804
Kasteele, Pet. Leon.		1811
Fokke, Arend .	1755	1812
Feith, Rhynvis .	1753	
Helmers, Jan Fred.	1764	1813
Moens, Petronilla .	1753	
Bilderdijk, Will. .	1756	1813
Van Kampen .		1839
Loots, Cornelius .	1761	
Kinker, Johan .	1764	
Loosjes, Adrian .	1762	
Tollens, Hendrik Corn.	1780	

NETSCHER, CASPAR, was born in 1619, at Heidelberg, from which place his family removed to Arnheim. In this city he was adopted by Dr. Tullekens, a rich physician, who placed him first under Koster, a painter of poultry and dead game, and afterwards under Gherard Terburg, at Deventer. He afterwards set out on his travels, intending to pass some time in Italy, but he got no farther than Bordeaux, where he married, and after the birth of his eldest son, in 1661, returned to Holland and settled at the Hague.

C. Netscher was one of the best painters of the Dutch school on a small scale. The necessity of providing for a numerous family obliged him to devote a considerable portion of his time to portrait-painting, in which he acquired great reputation, though he had talents for higher departments of the art. His most admired works are his Conversation pieces. His colouring is true to nature. He was a perfect master of chiaroscuro; his touch is extremely delicate; above all, he is remarkable for his skill in representing linen, white satin, silks, and velvet, the draperies of which are cast in large and elegant folds. All the accessories, the furniture, ornaments, Turkey carpets, &c., are painted with inimitable truth and minuteness, but still they do not divert attention from the figures, with which they form a delightfully harmonious whole. King Charles II. invited him to London, but he declined that honour, preferring the enjoyment of an established reputation in his own country. He died in 1684, aged forty-three years.

Theodore Netscher, his eldest son, who was born in 1661, was his father's disciple. He went at an early age to Paris, where he remained twenty years, highly esteemed, and acquiring considerable wealth by possessing the happy art of taking an agreeable likeness. He was employed to paint a vast number of portraits of the principal persons about the court, especially the ladies.

In 1715 he came to London as paymaster of the Dutch forces, and was introduced to the court by Sir Matthew Decker. He remained in England six years, and acquired large sums of money by his painting. After his return to the Hague he lost a considerable sum through some deficiency in his accounts, and retired in disgust to Hulst, where he died in 1732.

Constantine Netscher, the second son of Caspar, born in 1670, closely imitated the style of his father, many of whose portraits he copied in order to form his hand, but he did not

neglect the study of nature. He attained to a high degree of excellence, and was earnestly solicited by the duke of Portland, whose portrait he had taken, to go with him to England, but he was too infirm to undertake the voyage, being severely afflicted with the gravel, which at last carried him off, in 1722, at the age of fifty-two years.

NETTLE, a name applied to various plants. The true Nettles are various species of the genus Urtica, well known for their stinging properties, which are owing to the presence of an acrid poisonous secretion, that in some Indian species is so dangerous as to cause excruciating pain and even death. Dead-nettles are species of Lamium, monopetalous plants belonging to Labiatæ, and wholly inert. The Nettle-trees belong to the genus Celtis, also destitute of stinging properties, but having leaves resembling those of some kinds of Urtica.

Notwithstanding the acridity of the true Nettles, they are, when young, used for food, after being boiled, and form a favourite and wholesome ingredient in the spring-broth of the country-people in many parts of England, especially in Yorkshire. They also yield a tough fibre which may be used as a substitute for hemp; one of the species is indeed named *Urtica cannabina*, in consequence of its resemblance to Cannabis, or hemp, in the uses to which it is applied.

NEUBECK, VALERIUS WILHELM, born at Arnstadt in Thuringia, January 21, 1765, studied at Göttingen and Jena, at which latter university he took his degree as doctor of medicine, and practised first at Liegnitz, and afterwards at Steinau. His only professional production was his thesis 'De Natatione frigida, magno Sanitatis Præsidio;' it being as a poet that he acquired his literary reputation, chiefly however by his didactic poem entitled 'Die Gesundbrunnen' (or Mineral Springs), a production that has been greatly extolled by Schlegel as the very best that had then appeared in the language, enriched with admirable descriptions and imagery, and one in which the German hexameter verse is treated with the greatest ability. It was first published at Breslau, in 1795, and in 1798 a splendid folio edition of it appeared at Leipzig. Among his other productions is a translation of Dr. F. Sayer's 'Dramatic Sketches of the Antient Northern Mythology,' and several contributions, both in prose and poetry, to various literary journals.

NEUBURG, sometimes called **NEUENBURG**, is a well-built town in the Bavarian circle of the Upper Danube, agreeably situated on an eminence on the Danube, and opposite to an island which is connected with the town by a bridge. Among the public buildings are a large handsome palace, which contains the great hall, with a collection of antient armour; a college, formerly belonging to the Jesuits; a rich library, a collection of antiquities, a gymnasium, extensive barracks, the church of St. Peter, with a wonder-working image of the Virgin, two other churches, an hospital, and an orphan asylum. Neuburg is the seat of a court of appeal, and of the courts of justice of the circle and the town. The inhabitants, who are 6000 in number, have considerable breweries and distilleries, a manufactory of earthenware, and a flourishing trade. In the neighbourhood are the royal country-seats of Grunau and Petzelheim, the royal stud at Rothenfeld, and, near the village of Unterhausen, the monument erected in honour of Latour d'Auvergne, 'the first grenadier of the French army,' who lost his life there, by the wound of a lance, on the 27th of June, 1800. Neuburg was formerly the residence of the palsgrave, and the capital of the antient principality of Neuburg, called also the younger palatinate, which, in 1794, consisted of several detached portions, amounting together to 1050 square miles, with 96,586 inhabitants, chiefly Roman Catholics. It yielded a net revenue of 136,000 florins. At the beginning of the sixteenth century it was allotted to a separate line of palsgraves, which was divided into the branches of Neuburg and Sulzbach. The elder line, that of Neuburg, succeeded in 1685 to the electorate of Bavaria, and became extinct in 1742, on which the younger branch of Sulzbach inherited both the principality of Neuburg and the electorate.

There are several other towns, of less importance, of the same name in different parts of Germany.

NEUFCHÂTEAU. [Vosges.]

NEUFCHÂTEL. [Seine Inférieure.]

NEUFCHÂTEL (generally written *Neuchâtel*, but called *Neuenburg* by the Germans), a canton of Switzerland, situated in the Jura mountains, which here form several parallel narrow ridges running in the direction of north-east to south-west, and separated by elevated longitudinal valleys. The greatest length of the canton is about thirty-one miles, from the Verrières, on the frontiers of France, on the road from Pontarlier to Neufchâtel, to Le Pasquier at the north-east extremity of the Val de Ruz, on the road to the Val d'Imier, in the canton of Bern; its greatest breadth, from the lake to the river Doubs, on the French frontier, is about thirteen miles direct distance. Its area is reckoned at about 250 square miles. It is bounded on the west by the French department of Doubs, the river Doubs forming the boundary along one part of the line; on the south by the Canton de Vaud, on the east by the lake of Neufchâtel, and on the north by the canton of Bern. The canton is naturally divided into three regions: 1, the 'Vignobles,' being the banks of the lake, the level of which is 1400 feet above the sea, and the lower hills which rise immediately above, and are planted chiefly with vines; 2, the 'Vallon,' or the two fine valleys, Val de Travers and Val de Ruz, which run between two parallel ridges of the Jura, and rise from 2000 to 2400 feet above the sea; they produce corn, pulse, and fruits; 3, the 'Montagnes,' or highlands of the Jura, nearer to France, consisting of some naked and some wooded ridges, with high bleak valleys intervening, which are known by the names of La Chaux de Fond, Locle, Chaux du milieu, La Brevine, and La Sagne; they are nearly 3000 feet above the sea, and produce little else than grass, but have become the seat of manufacturing industry, especially watchmaking and jewellery. The highest summits in the canton of Neufchâtel rise to about 4000 feet above the sea, but their visible elevation, as seen from the neighbouring valleys, is not striking, the whole country being highland.

Nearly one half of the surface consists of pasture-land or artificial meadows; one-eighth is arable land, another eighth is forest, and about 5000 acres are planted with vines. The wines of Neufchâtel are the best in Switzerland; the red wine of Cortaillod is equal to good Burgundy. Three-fifths of the wine are exported. The rearing of cattle and making of cheese constitute two other important branches of rural industry. According to recent returns there are about 16,000 head of large cattle, 7500 sheep, 7200 goats, and 2200 horses and mules. Honey is made in considerable quantity.

The population of the canton in 1837 amounted to 58,616, of whom 14,534 were natives of other parts of Switzerland, and 3214 strangers from other countries. Neufchâtel is one of the few countries where foreigners enjoy the same protection and security as the natives, are subject to the same laws without distinction of country or religion, and can form a settlement and purchase property; they do not however possess all the rights of citizens unless they become naturalized, which is easily effected. Of this population about 10,000 are employed in agriculture, 7000 are watchmakers, and between 3000 and 4000 are employed in cotton and linen manufactories. The women, especially in the Val de Travers, are employed in the manufacture of lace. The common trades, such as those of carpenters, masons, bakers, tailors, and shoemakers, are chiefly carried on by foreigners, as the natives prefer employing themselves in watchmaking and other ingenious industry. The religion of the people is the Protestant Calvinist, with the exception of about 2000 Catholics, who live chiefly in the district of Landeron. The language is French, which is spoken correctly by educated people, but the country-people speak various patois resembling those of their neighbours of Franche Comté and of the Canton de Vaud.

Neufchâtel, the capital, is built partly on the bank of the lake and partly on two hills divided by the river Seyon, which comes from the Val de Ruz. It contains 667 houses and 6300 inhabitants. On one of the two hills is the castle, which was built in the thirteenth century, and near it the cathedral, which dates from the tenth, and contains the tombs of the antient counts of Neufchâtel, and of Farel, who established the Reformation at Neufchâtel. In the lower town are the hôtel-de-ville, or town-house, which is very handsome, and the hospital for the burgesses, the orphan asylum, the hospital founded in 1810 by Pourtales the wealthy merchant, and a fine college, which was completed in 1835, and contains a public library and a cabinet of natural history. The lower town, generally speaking, is well built, and has a fine appearance when seen from the lake. Neufchâtel has several elementary schools, a savings'

bank, an insurance company, a bible society, and a missionary society. There is no other town of any importance in the canton, but there are many large villages, and the valleys of the Locle and La Chaux de Fond contain a great number of scattered habitations occupied by manufacturers.

Neufchâtel is a principality of which the king of Prussia, as representative of the house of Brandenburg, is the sovereign prince, but it has a representative assembly or legislative body consisting of eighty-five members, of whom seventy-five are returned by the electors of the various districts, and ten are named by the prince. They are appointed for six years. All the native or naturalized subjects of Neufchâtel who are twenty-two years of age, and not paupers or bankrupts, are electors. The candidates for the legislative body must be possessed of landed or house property of the value of 1000 francs. The laws are proposed by the executive, and also by the members of the legislature. The king or his representative gives or refuses his sanction to the bills which have passed the legislature. All the officers in the administration must be natives, except the governor, who is generally a Prussian officer of rank, and receives a salary of 10,000 francs annually. The civil list of the prince amounts to 70,000 francs.

The county of Neufchâtel was a fief of the old kingdom of Burgundy, and it had its line of counts until A.D. 1288, when it passed into the house of Châlons, from which it came into that of Longueville. Mary duchess of Némours, the last of this house, dying in 1707, Frederic I., king of Prussia, claimed the succession as heir of the house of Châlons, and the assembly of the three estates of the county recognised his claim. Bonaparte obliged the king of Prussia to surrender Neufchâtel in 1806, and he gave it to General Berthier, but in 1814 the county returned to the allegiance of the house of Brandenburg, and it was at the same time received as a canton into the Swiss confederation, of which it had already been for a long time an ally.

The *Lake of Neufchâtel*, called also the *Lake of Yverdun*, is twenty-five miles in length from north-east to south-west, and about five miles in its greatest breadth; but it is much narrower in its southern part, being not quite two miles wide near the town of Yverdun, which is at its south-west extremity. Its greatest depth towards the middle is about 400 feet. Its feeders are, 1, the river Orbe from the south-west, which has its source in the Jura, and crosses a great part of the Canton de Vaud; 2, the Broie, which comes from the lake of Morat in the canton of Friburg; 3, the Reuse, which flows from the Val de Travers in the canton of Neufchâtel; and 4, the Seyon, which comes from the Val de Ruz, also in the same canton. The outlet of the lake of Neufchâtel is the Thiele at the north-east extremity, which carries its waters into the neighbouring lake of Bienne, from whence there is an outlet into the river Aar. [BIENNE.] The lake of Neufchâtel abounds with fish. A steam-boat of 20-horse power plies on this lake, and proceeds also by the Thiele into that of Bienne as far as the town of that name, and occasionally it also ascends by the Broie into the lake of Morat. The country lying between these three lakes is called Seeland, and is mostly low, and in seasons of great floods part of it is inundated, so as to form only one lake. This was the case in 1816. The basin of the lake of Neufchâtel belongs to the water-system of the Rhine, and is divided from that of the lake of Geneva by the ridge called Jorat, which runs from south-east to north-west, through the centre of the Canton de Vaud. The level of the lake of Neufchatel is nearly 200 feet above that of the lake of Geneva. (Leresche, *Dictionnaire Géographique de la Suisse.*)

NEUHAUS (in Bohemian, *Gindrzichu Hradecz*) is a well-built town in the circle of Tabor, in Bohemia, 68 miles south-south-east of Prague. It is the chief place of a lordship belonging to Count Czerny, whose palace is a very magnificent edifice. It has one of the finest churches in Bohemia; a gymnasium, which formerly belonged to the Jesuits; a school; and extensive manufactories of woollens, linen, paper, and playing-cards. The population of the town and suburbs amounts to nearly 6000. A great part of the town was destroyed by fire in 1801. Fine topazes are found in the vicinity.

NEUHOFF, THEODOR VON, known at one time as King Theodore, a German adventurer, was born towards the end of the seventeenth century, of the noble family of the counts of La Mark in Westphalia. His father was an officer in the French service, and he himself obtained a lieutenant's commission in the regiment of Alsace. He afterwards went to Spain, and gained the favour of Cardinal Alberoni, who gave him the rank of colonel in the Spanish service. In Spain he married a lady of honour of the queen, whom he deserted, and carried off her jewels. He then travelled through various countries under different names and titles, Sweden, Holland, Italy, and at last was put in prison for debt at Leghorn. On coming out of prison, he met with several Corsican leaders, among the rest with the canon Orticoni, who had known him at Genoa in 1732, and he proposed to undertake the cause of the Corsicans, who were then at war with the Genoese; he spoke of his high connections and his means of being useful in various ways. The Corsicans were then in the predicament of drowning men catching at straws. Orticoni believed or seemed to believe the adventurer, and promised to use his influence to have him named king of Corsica, on condition that he should first bring substantial assistance to his countrymen. Neuhoff upon this sailed for Tunis, where he succeeded in persuading the Bey to lend him arms and ammunition, promising him in return the exclusive trade of the island and a station there for his piratical vessels. The Bey entered into his views, and gave him ten pieces of cannon, four thousand muskets, with ammunition, shoes, corn, and about ten thousand gold sequins. It is a subject of astonishment how Theodor contrived to get so much from the Moorish chief, but the fact is authentic. He sailed from Tunis on board an English vessel with his cargo and a retinue of sixteen persons, including two French officers, and several Turks, and arrived on the 12th of March, 1736, in the roads of Alesia, on the eastern coast of Corsica. In the following April the general assembly of Corsicans elected Theodor for their king, and he swore to the draft of a constitution for the new kingdom which was then proclaimed. (Botta, *Storia d'Italia*, b. 42.) The rest of the story is briefly told under CORSICA. After many vicissitudes, Theodor died in London, in December, 1756, and was buried in St. Ann's churchyard, Westminster, where the epitaph on his tombstone records the singular events of his life.

NEUILLY. [SEINE.]

NEUKIRCH, BENJAMIN, a German poet of the seventeenth century, was born at Reinke, a village in Silesia, March 27, 1665. His earlier productions partake of the bad taste which stamps that period of German literature; yet although he greatly improved after his literary acquaintance with Canitz at Berlin, and was considered a reformer in poetry during his own day, he possessed few of the requisites that recommend a writer to posterity. Hence, though deserving a notice in literary history, it is chiefly on account of having contributed to bring a new mode of writing into vogue. His poetical translation of Fénélon's 'Telemachus' may be classed with the Russian one of Trediakovsky, a work of most unenviable celebrity in the language to which it belongs. His best productions are his satires and poetical epistles. He died at Anspach, August 15, 1729, in his fifty-sixth year.

NEUKIRCHEN is a town in the Saxon Voigtland, with a population of 1200 inhabitants, among whom there are 90 manufacturers of violins and violoncellos, 40 makers of wooden and 36 of brass wind-instruments, above 30 manufacturers of catgut-strings, and 45 makers of violin bows, besides many other persons also employed in making pegs, bridges, finger-boards, &c. They have made in one year (including the village of Adorf) 6220 bundles of violin and violoncello strings, 241 dozen of stringed instruments, 177 dozen of violin bows, 109 dozen of violoncello-bows, 316 clarionets, 46 oboes, 522 flutes, 46 bassoons, 96 octave flutes, 12 piccolo flutes, 13 basset-horns, 290 French horns, 172 trumpets, 17 pair of kettle-drums, and 214 post and bugle horns.

NEURA'LGIA, a word of modern origin (derived from νεῦρον, a 'nerve,' and ἄλγος, 'pain'), first employed by Chaussier to designate a certain class of diseases of which the characteristic symptom is a most acute pain following the course of a nerve in one or more of its ramifications, subject to paroxysms and intermissions, in most cases unattended by either heat, redness, or swelling, and often without any apparent lesion at all.

Although from the nature and causes of the affection we have every reason to believe that neuralgia must have existed in all ages, still (historically speaking) it may be called

a modern disease, as the first distinct description of it that we possess is that published by André, a surgeon of Versailles, in 1756, in his 'Observ. Prat. sur les Maladies de l'Urèthre.' He however had only met with one species, viz., *Neuralgia Faciei*, which he called 'Tic Douloureux*,' a name which, in popular language, it still retains; but since his time the same disease (subject only to certain local modifications) has been observed in various other parts of the body, and it is probable that almost every organ is liable to be affected by it. Chaussier has enumerated nine species (of which the three first are merely varieties of the Neuralgia Faciei), viz.: 1, *Neuralgia Frontalis*, which is seated in the frontal division of the first or ophthalmic branch of the fifth pair of cerebral nerves. The pain begins at the supra-orbital foramen, and extends to the forehead, the upper eyelid, the eyebrow, the caruncula lachrymalis, the inner canthus of the eye, and sometimes to the whole of that side of the face. 2, *Neuralgia Suborbitalis*, which occupies the superior maxillary nerve, or second division of the fifth pair. The pain begins at the infra-orbital foramen, and extends to the cheek, the upper lip, the alæ nasi, the lower eyelid, and the teeth of the upper jaw. 3, *Neuralgia Maxillaris*, which is seated in the inferior maxillary nerve, or third division of the fifth pair. The pain commences at the mental foramen, and either extends to the chin and lip, or else to the teeth of the lower jaw, the tongue, and the temple. 4, *Neuralgia Ilio-Scrotalis*, which occupies the ilio-scrotal nerve, or external division of the musculo-cutaneous branches given off by the lumbar plexus, and derived from the first lumbar nerve. The pain commences at the crista ilii, follows the spermatic cord, and extends to the scrotum and the testicle. 5, *Neuralgia Femoro-Poplitealis*, which is seated in the great sciatic nerve. The pain begins over the sacrum, or about the great trochanter, follows the course of the nerve down the posterior part of the thigh to the popliteal space, and thence extends along the peroneal nerve, or external division of the great sciatic, to the outside of the foot. 6, *Neuralgia Femoro-Prætibialis*, which occupies the crural nerve, given off by the lumbar plexus, and derived from the second, third, and fourth lumbar nerves. The pain commences at the crural arch, extends along the anterior and internal part of the thigh, and sometimes follows the course of the internal saphenous nerve, one of the *deep-seated* branches of the crural, to the inner ankle and the dorsum of the foot. 7, *Neuralgia Plantaris*, which is seated in the external and internal plantar branches of the posterior tibial nerve, or internal division of the great sciatic. The pain begins at the heel, shoots across the sole of the foot, and extends sometimes up the calf of the leg towards the knee. 8, *Neuralgia Cubito-Digitalis*, which occupies the ulnar nerve, given off by the brachial plexus, and derived from the fifth, sixth, seventh, and eighth cervical nerves. The pain sometimes commences at the upper part of the arm, and follows the course of the nerve along the ulnar border of the fore-arm to its termination in the inside of the middle, the ring, and the little fingers; sometimes only part of the nerve is affected, and the pain is confined to the humerus, or commences at the elbow. 9, '*Névralgies Anomales:* douleurs ordinairement chroniques, dont le siège varie à l'infini.' Several of these have been particularly described, and constitute so many additional distinct species:—1, *Otalgia* (described by M. Itard), which is seated in the chorda tympani, a portion of the vidian nerve, or posterior branch of Meckel's ganglion; and which is characterised by an acute pain following the course of this nerve. 2, *Neuralgia Cervicalis* is of rare occurrence: M. Bosquillon has observed two cases after opening the external jugular vein, in consequence of wounding the superficial branches of the cervical plexus formed by the anterior branches of the second, third, and fourth cervical nerves; and M. Jolly has met with another after the application of leeches to the side of the neck. 3, *Neuralgia Intercostalis* (first described by Siebold, and afterwards by Corvisart) occupies either a portion or the whole of one of the intercostal nerves, generally in the lower part of the thorax. 4, *Neuralgia Cervico-Brachialis* (first noticed by Professor Fulci of Catana) is seated in the internal cutaneous nerve, a branch furnished by the brachial plexus. The pain begins at the anterior and internal part of the shoulder, and descends along the inner side of the arm and fore-arm to the wrist. Sometimes it extends not only to all the branches of the internal cutaneous nerve, but also to those of the external, and then becomes confounded with the following species. 5, *Neuralgia Musculo-Cutanealis* was first described by M. Martinet, and occupies the external cutaneous (or *musculo-cutaneous*) nerve, another branch derived from the brachial plexus. The pain commences at the shoulder, descends along the anterior external surface of the arm and fore-arm as far as the wrist. 6, *Neuralgia Supra-Scapularis* was also first described by M. Martinet, and is seated in the suprascapular nerve, another branch given off from the brachial plexus. The pain begins at the inferior angle of the scapula, passes along its posterior surface, and sometimes descends along the radial border of the fore-arm to the thumb and fore-finger. 7, *Neuralgia Mammæ*, first described by Dr. Good as consisting of 'sharp, lancinating pains, divaricating from a fixed point in the breast, and shooting equally down the course of the ribs and of the arm to the elbow; the breast retaining its natural size, complexion, and softness.' 8, and last, *Neuralgia of the facial nerve, or portio dura of the seventh pair*, about the existence of which there is great room for doubt; for as this is a nerve of *motion* and not of *sensation*, it is not easy to understand how it should be liable to be effected by a disease which is in general simply and purely painful. However it is still more difficult to deny the fact; numerous instances have occurred in which the disease has (to all appearance) been seated in this nerve, and several wherein the pain has not only followed its ramifications with great exactness, but has also been attended by convulsive twitchings of the facial muscles, and even by their paralysis. Dr. Elliotson (*Cyclop. of Pract. Med.*, art. 'Neuralgia') admits without scruple the possibility of the portio dura being affected; Mr. Cooper (*Dict. of Pract. Surg.*) inserts this species as the fourth division of the Tic Douloureux; and Dr. Good (*Study of Med.*) says that the nerve in question 'is more frequently the seat of affection than any of the branches of the fifth pair seem to be.' But Dr. Rowland (*Treat. on Neuralgia*, 1838) is still inclined to 'doubt whether this nerve is capable of being affected with neuralgia,' and rests his opinion partly on 'a case mentioned by Thouret (*Hist. de la Soc. Roy. de Méd.*, t. ii.), where the pains apparently followed the ramifications of the portio dura, commencing at the stylo-mastoid foramen, and spreading over the cheek. With the hope of effecting a cure, the facial nerve was divided at its exit from the cranium, but no mitigation of the sufferings followed; and the only result of the operation was paralysis of the muscles of that side of the face.' This must be admitted to be a very important fact, but there are others equally strong in direct contradiction as to the result, especially that most interesting case related at length by Dr. Darwin in the second part of his 'Zoonomia,' where three branches of the facial nerve were successively divided, and each operation was attended with great relief. Upon the whole, if the possibility of this nerve being affected with neuralgia be admitted, the apparent contradiction involved is probably one of those of which, in the present state of science, a perfectly satisfactory explanation cannot be given.

But besides these external forms of neuralgia, the disease has sometimes been found to attack various internal organs. This was first suggested by Dr. John Fothergill in 1773, who says (in vol. v. of the 'Med. Observ. and Enquiries' 'There are few physicians, I believe, who may not in reviewing many cases, which have occurred to them, of anomalous pains in different parts of the body, so as sometimes to counterfeit gouty, bilious, and other internal affections of the stomach and bowels, perceive some analogy between them and the complaint here pointed out;' but it is only lately that pathologists have begun to enumerate these 'anomalous pains,' and class them as so many distinct species of neuralgia. Sometimes the central mass of the nervous system is affected, and we find the terms 'Cerebralgia' and 'Myelalgia' employed by some modern French authors to designate neuralgia of the brain and of the spinal chord. (Raciborski, *Précis du Diagnostic*, 1837.) Sometimes, instead of the branches of a nerve, the extreme filaments only are diseased, as would appear to be the case in many of those

* The meaning of the term 'Tic Douloureux' appears to be rather doubtful. In the 'Dictionnaire de Trévoux,' the word '*Tic*' is said to mean, first, a vicious trick that horses have of biting the manger; and secondly, 'a sort of convulsive movement to which some persons are subject.' These twitchings not being accompanied with pain, the epithet 'douloureux' was added to distinguish those in neuralgia from every other sort. Dr. Good however considers the word '*tic*' to be 'an onomatopy, or sound expressive of the action it imparts.' The 'Tic Douloureux' is called 'Dolor crucians Faciei,' by Fothergill; 'Trismus Maxillaris,' and 'Trismus Dolorificus,' by Sauvages; 'Prosopalgia,' by Swediaur; 'Neuralgia Faciei,' by Good; 'Autalgia Dolorosa,' by Young.

kinds of pain commonly called 'rheumatic' (MM. Jolly and Piorry, quoted in Raciborski). To these have been added torticollis, lumbago, angina pectoris, neuralgia of the arteries, gastralgia, enteralgia, hepatalgia, nephralgia, hysteralgia, neuralgia of the heart, testicle, bladder, urethra, diaphragm, &c. (Raciborski, Rowland, Elliotson, &c.) It may perhaps be rather fanciful to give the name 'neuralgia' to all these cases, and it would take up too much space to describe each separately; but they are all more or less characterised by the same peculiar sort of pain, coming on and leaving off suddenly, extremely acute while the paroxysm lasts, and subject to intervals of complete cessation.

Of the remote or predisposing causes of neuralgia very little is known, but it has been supposed to attack females more frequently than males, the rich than the poor, those that live in towns rather than the inhabitants of the country. It is also most common among persons of a nervous temperament, and both infancy and old age are comparatively safe from its attacks. The immediate or exciting causes are very numerous, and sometimes extremely obscure. Among the most common may be mentioned, exposure to wet and cold, mental excitement and agitation in persons of an irritable temperament, and a deranged state of the digestive organs, though with respect to this last it should be noticed that some eminent pathologists seem inclined to think that this is seldom if ever the case. Local injuries of various kinds are another very frequent cause of the disease; such as the lodgement of any foreign body in the branch of a nerve, wounds, contusions, cicatrices, the too great distension of a nerve, carious teeth, &c. Sir Henry Halford has published in his 'Essays' five cases showing that sometimes 'the disease is connected with some preternatural growth of bone, or a deposition of bone in a part of the animal economy where it is not usually found in a sound and healthy condition of it, or with a diseased bone;' and Sir Benjamin Brodie, in his 'Lectures on Local Nervous Affections,' mentions several where the pain was occasioned by the pressure of an aneurysmal or other tumour. Several other causes are enumerated by Dr. Rowland in his treatise on neuralgia, viz. diseases of the urinary organs, disorder of the heart and large vessels, uterine disorders, spinal irritation, organic diseases of the brain and spinal marrow, malignant diseases, chronic inflammation, malaria, and anæmia. In many cases however no exciting cause whatever can be discovered either during life or after death.

With regard to the seat of neuralgia, there can be little doubt but that it is in the nerve itself; but it is equally certain that the part where pain is felt is not always the part diseased. The pathology of the disease is extremely obscure and uncertain, chiefly from the difficulty of deciding the question of its supposed identity with neuritis; and this difficulty is much increased by an examination of the contradictory evidence brought forward on each side, by the men most eminent for talents and experience. Larrey ('On the Use of the Moxa') speaking of tic douloureux, describes it as 'a chronic and inflammatory turgescence of the neurilema, which envelopes the nerves of the part affected;' Sir Astley Cooper on the other hand, in his 'Lectures on Surgery,' admits that it is difficult to say what is the real nature of the disease, but goes on to declare that 'the nerves are not in an inflamed state most certainly, for under the most horrid suffering they are found of a natural colour; they are not increased either in their usual size, but on the contrary are found to be rather diminished.' Upon the whole, the truth seems to be that, in general, no signs of inflammation are found either during life or after death; but at the same time we cannot refuse to believe the positive evidence brought forward to show that in some cases the nerve has been found larger than usual and of a deeper colour, and the neurilema unnaturally thick and distended by serous infiltration. (See the instances collected by Dr. Rowland, *Treat. on Neur.*) Where these morbid appearances have been occasioned by acute neuritis, the course of the disease is so different from that of neuralgia, that the two affections can hardly be considered to be identical; where the case has been one of chronic inflammation, it may still be doubted whether we should not consider this to be one of the causes of neuralgia, rather than the disease itself to be of an inflammatory nature.

The diagnosis of neuralgia is not in general very difficult, for even when it does not follow the course of a nerve, it may commonly be distinguished from every other disease by the peculiar character of the pain, its excessive violence during the paroxysm, and the absence of all symptoms of fever and inflammation. It may sometimes be difficult at first sight to distinguish neuralgia from neuritis, inasmuch as the two diseases resemble each other in some of their most prominent symptoms; but by observing the following diagnostic signs (derived from the general character of inflammation in all parts of the body), the danger of confounding them may be avoided. In neuritis the pain is continual, as is the case in all inflammations; in neuralgia it is never constant, but is subject to paroxysms and intermissions. In neuritis the pain is aggravated by the slightest pressure; in neuralgia, on the contrary, it is sometimes alleviated by it. To these it may be added that in neuritis we shall find the usual attendants of inflammation, viz. heat, redness, and swelling; while in neuralgia (as noticed above) these are rarely if ever present.

The prognosis will of course depend very much on the nature of the exciting cause of the disease, but still as a general rule it is extremely uncertain. Sometimes, when every remedy has been tried in vain, a cure will be effected by time alone, for it seems that all the sensitive part of the nervous system is liable to become dull and lose its powers by a long series of irritation; yet even this hope cannot be depended on, as there are some cases on record (quoted by Dr. Rowland) where the disease has continued even to the age of eighty-five.

With regard to the treatment of neuralgia, it would appear quite superfluous to say that it must be regulated by the circumstances of each particular case, if it were not notorious that no disease has been treated more blindly and empirically. The favourite remedy at present is the sesquioxide of iron, which was first brought into notice by Mr. Hutchinson of Nottingham ('Cases of Neuralgia Spasmodica, &c.,' Lond., 1820), and which now occupies a place in public favour that has been successively held for a longer or shorter period by almost every active and powerful substance in the 'Pharmacopœia.' Yet every practitioner will readily be able to imagine cases, even if he has not met with them in his own practice, where the exhibition of this medicine must be entirely useless, and in no disease is there more truth in the maxim 'sublatâ causâ tollitur effectus.' When any foreign body presses upon the nerve, or when the pain can be distinctly traced to a carious tooth, the removal of the source of irritation will commonly be sufficient to cure the disease; though the practitioner should be especially warned against the danger of confounding neuralgia with the tooth-ache, an error that is not unlikely to occur in some cases of tic douloureux, and one that has often occasioned the loss of several teeth to the patient without any good effect. When (as is sometimes the case) the disease appears to be occasioned by the irritation arising from an old cicatrix, it will be expedient to try the effect of applications to the cicatrix itself, viz. either the nitrate of silver, or the actual cautery, or a blister, or a crucial incision over the part, or even its removal by the knife. And in the same way, when it can be distinctly referred to any other of the exciting causes enumerated above, the removal of that will probably be followed by the disappearance of the disease. But, as already observed, it very frequently happens that the exciting cause cannot be discovered, and in these cases the treatment must necessarily be in a great degree empirical. When the paroxysms are irregular in their duration and recurrence, perhaps the sesquioxide of iron is the best remedy at present known: it may be given in doses of half a drachm three times a day in twice its weight of treacle. When the pain recurs after certain regular intervals, those medicines which are found to be most efficacious in the treatment of ague may be exhibited with advantage. The disulphate of quina may be given in doses of four or five grains three times a day, though this medicine has sometimes been given in much larger quantities, and Sir Benjamin Brodie mentions one case where the patient took as much as half a drachm daily. (*Local Nervous Affections*, p. 28.) The liquor potassæ arsenitis is another excellent medicine which may be employed in this form of the disease; the dose is at the commencement four or five minims three times a day, which may gradually and cautiously be increased to eighteen or twenty. When there are any signs of inflammation present, that the disease may seem rather to deserve the name of neuritis than of neuralgia, it must be treated accordingly, and the usual antiphlogistic remedies, both external and internal, may be

employed. In almost every case of neuralgia it will be advisable to exhibit some preparation of opium, both to relieve the pain, and also in order to procure the patient some sleep at night, at which time the paroxysms are often much aggravated; and especial care must also be taken not only to prevent the constipation caused by this drug, but also to keep up a free evacuation of the bowels, as in some cases the disease appears to have been cured by purgative medicines alone. A very interesting lecture on a case of neuralgia was delivered at St. Thomas's Hospital, Nov. 26, 1832, by Dr. Elliotson, which affords an example of the amount to which the doses of several powerful medicines may be carried in this disease. The sesquioxide of iron was increased to an ounce every three hours, to which was gradually added fifteen grains of the sulphate of iron. From this treatment the patient received some degree of benefit, but it was only temporary. In the same case strychnia was given to the amount of three-fifths of a grain three times a day, eight grains of the hydrochlorate of morphia twice a day, and nine minims of hydrocyanic acid three times a day, to prevent the sickness occasioned by doses of twenty minims of the liquor potassæ arsenitis. After remaining in the hospital more than six months, the patient went out nearly as bad as when he first came in. (*The Lancet*, No. 484.)

Among local applications may be mentioned the unguentum veratri, emplastrum opii, and empl. belladonnæ, or a lotion (recommended by Dr. Bennett, of Charleston in America), composed of four ounces of the aqua laurocerasi and one ounce of sulphuric æther, either alone or with half or one drachm of the extract of belladonna. (*British and Foreign Medical Review*, vol. i., p. 263.) Counter-irritants have often proved very efficacious, particularly the application of a common blister, and, after the cuticle has been removed, the sprinkling over the denuded surface a quarter or half a grain of the acetate or hydrochlorate of morphia. Moxas and issues have also been tried with success.

After all other remedies, both internal and external, have failed, the patient's last resource is the operation either of dividing the nerve or removing the limb; and even this will very often fail also. When the disease depends on some local irritation or resides in the extremity of the nerve, the operation is frequently successful; but when it proceeds from constitutional causes, or exists either in the brain itself or nearer to it than the point where the nerve can be divided, in this case it is manifest that, as no benefit can reasonably be expected from the operation, the experiment ought never to be tried but at the earnest request of the patient. Sometimes the nerve is simply divided, but in these cases the pain very often returns as soon as the two extremities are reunited; sometimes a portion of the nerve is removed, but even this appears only to obtain for the patient rather a longer respite. Latterly, after part of the nerve has been cut away, the two ends have been touched either with nitrate of silver or the actual cautery, and in some instances this plan appears to have succeeded where the simple section of the nerve had failed. When the operation of dividing the nerve in facial neuralgia is to be performed, the following are the directions given by Sir Astley Cooper, in his 'Surgical Lectures:'—'If it should be deemed requisite to divide the suborbitar nerve, it should be done a quarter of an inch below the orbit: the nerve passes out of the foramen half an inch below; so that you are to divide it midway between the foramen and the edge of the orbit: if you divide it lower than this, you will leave some branches which will still continue the disease. The proper mode to adopt for dividing it is to introduce a sharp-pointed bistoury at the distance from the orbit already stated, and, carrying the point of the instrument close upon the bone, you hook up the nerve on its edge; then press upon the skin over the edge with your finger, and at the same time withdraw the knife through the opening by which it entered; in this way, as you take out the knife, the nerve will be divided. You ought to ask the patient if he feels a numbness of the upper lip, and if he should not, your operation will be incomplete. When necessary, the supra-orbitar branch is to be divided in a similar manner by introducing the knife under the integuments of the superciliary ridge; cut through the nerve immediately as it emerges from the supra-orbitar foramen, carrying the point of the knife from the nose outwards. When the infraorbital nerve requires division, you need not make any incision through the integuments, but may perform the operation by placing the knife within the mouth, and directing its point downwards to the mental foramen, where the nerve passes out, and by gliding the knife along the bone at that part, the nerve is sure to be divided. In performing this operation, you may direct your knife by the bicuspidati teeth, the anterior maxillary foramina being just below them.'

(Cooper's *Dictionary of Practical Surgery;* Good's *Study of Medicine;* Dr. Elliotson, in the *Cyclopædia of Practical Medicine;* Franck, *Praxeos Medicæ Universæ Præcepta*, t. iv.; M. Jolly, *Dictionnaire de Médecine et de Chirurgie Practiques*, t. xii.; Sir Benjamin Brodie, *On Local Nervous Affections*, 8vo., Lond., 1837; and Dr. Rowland's *Treatise on Neuralgia*, 8vo., Lond., 1838, which last is probably the most complete and valuable work that has been written on the subject.)

NEURI'TIS. [Neuralgia.]

NEURO'PTERA (from νεῦρον, a nerve, and πτερόν, a wing), one of the orders into which the class *Insecta* is divided. The insects composing this order may be distinguished by the following characters:—wings, four in number, membranous, generally naked, and more or less transparent, but sometimes hairy; the mouth is usually fitted for mastication, or furnished with mandibles and maxillæ; the larvæ are provided with six legs and are active, their metamorphosis is variable, but is usually semi-complete. The character which gave rise to the name, viz. the minute reticulation of the nervures of the wing, will also in most instances serve to distinguish the insects of the present order from others. The May-fly and dragon-fly afford familiar examples.

The order *Neuroptera* is divided by Latreille into three sections, to which he applies the names Subulicornes, Planipennes, and Plicipennes, under which heads the characters of these sections are described.

NEUSOHL. [Hungary.]

NEUSS, a Prussian town in the government of Düsseldorf, is situated in 51° 18′ N. lat. and 6° 45′ E. long., at the commencement of the canal which is to unite the Rhine and the Meuse, and at the influx of the Kruse into the Erft, which latter river has been made navigable, for vessels of moderate burthen, from this town to its junction with the Rhine, over which there is, near this junction, a bridge of boats to Düsseldorf. The Rhine flowed in the thirteenth century close under the walls of the town, from which it is now half a league distant. Neuss is still partly fortified with gates and towers, but the ramparts have been converted into public walks and gardens. There are two Roman Catholic churches, of which that dedicated to St. Quirinus is a fine Gothic edifice, one Protestant church, a synagogue, an orphan asylum, a lunatic asylum, an hospital, and a handsome town-hall. The inhabitants now amount to 8000, most of whom are Roman Catholics, there being only 150 Lutherans, 100 Calvinists, and 50 Jews. Neuss is a flourishing town, and has manufactures of woollen cloths, kerseymere, baize, flannel, cotton, cotton-yarn, worsted, handkerchiefs, tape, and hats; likewise a manufactory of cotton-cards, one of starch, an establishment for dyeing Turkish-red, and a quill and pen manufactory, in which 200,000 quills are clarified every week. There are also vinegar-makers, soapboilers, four oil-mills, and one fulling-mill. The inhabitants of the town and circle are also extensively engaged in agriculture and breeding of cattle, and have a great trade in corn, millstones, stone for building, square timber, planks, slates, and coals.

The town is said to have been built by Drusus, brother of Tiberius, who had thrown a bridge over the Rhine; one of the gates of the town is still called Drusus-gate. In the thirteenth century Neuss joined the Hanseatic league, and is celebrated for its brave resistance, in 1475, to Charles the Bold, duke of Burgundy, who besieged it for nine months. To reward the townsmen, many important privileges were granted to the city by the emperor Frederick III., who came to its relief. The bronze statue of Frederick stands in the market-place. It was here that the allied armies passed the Rhine, on their march to Paris, in 1815.

NEUSTADT, commonly called *Wiener-* or *Wienerisch-Neustadt*, in 47° 50′ N. lat. and 16° 15′ E. long., is situated on the extensive plain of the Steinfeld, on the navigable canal to Vienna, and at the junction of the Kehrbach

and the Little Fischa, not far from the frontiers of Hungary. Next to Vienna, it is the most considerable town in Lower Austria, containing, together with the suburb Leopoldstadt, 10,000 inhabitants, besides the military and the students of the academy. The town is pretty regularly built, nearly in the form of a parallelogram, with four gates; it is surrounded with a wall with towers, and a broad and deep moat. It is divided into four quarters, and has in the centre a large and handsome square, surrounded with arcades. The principal building is the antient archducal palace, built in 1186 by Leopold the Virtuous, and assigned in 1762 by the empress Maria Theresa to the imperial military academy. It is a strong square edifice with a tower, and surrounded with ditches, which however are now dry, and have been converted into kitchen-gardens and plantations of fruit-trees. This academy has 36 professors and 500 pupils. The beautiful Gothic chapel of St. George, allotted to the academy, contains, among other monuments, that of the emperor Maximilian I., and some good paintings on glass of the fifteenth century. The academy has a good library, a collection of philosophical instruments, a school for drawing, an artillery-hall, containing a complete model of a fortress, a hall for gymnastic exercises, a manege, a winter bath, a refectory, with the portraits of distinguished Austrian generals, and a walled garden, 1400 yards long and 1200 broad, which was formerly a park, and is still so called. The church of Our Lady, formerly the cathedral while the place was a bishop's see, is a large stone edifice of the thirteenth century, with two lofty towers; it contains some good paintings, and, among other grave-stones, those of counts Zriny and Frangipani, who were beheaded for high-treason in 1671. Two other churches have been converted into warehouses. Of the other buildings, the chief are, a Cistercian abbey, which has a library of 20,000 volumes and a beautiful collection of minerals and shells; a military hospital, a civil hospital, and a gymnasium. There are manufactories of velvet, silk, cotton yarn, earthenware, and paper. Neustadt, being so advantageously situated on the high road from Vienna to Styria, and likewise an entrepôt for the commerce between Hungary and Italy, carries on a very brisk trade by water with Vienna, and by land with all the provinces of the Austrian empire. This place was built by Leopold the Virtuous between 1192 and 1194, and on account of its fidelity to its prince, which was particularly manifested under Frederic the Valiant in 1236, and Frederic IV., 1452, and in the siege by the Turks in 1529, has received the honourable appellation of 'Always Faithful.'

This flourishing town was nearly destroyed by a dreadful conflagration on the 8th September, 1834, which in a few hours burnt 500 houses and several public buildings. This calamity was fortunately followed by a mild autumn and winter, so that the rebuilding of the houses was not stopped. The emperor Francis, besides a very large sum from his privy purse, assigned 100,000 florins from the public treasury: all the members of the imperial family contributed amply, and immense contributions flowed in, not only from every part of the Austrian empire, but from foreign countries, both in money and clothing, provisions, &c., which, added to the sums paid by the insurance offices, enabled the inhabitants entirely to rebuild the town and to resume their usual occupations.*

NEUTER. [GENDER.]

NEUTRAL SALTS. Formerly this term included such salts as did not obviously contain an excess either of acid or alkali, and this was determined by their action upon vegetable colours. Such for example as had an alkaline or earthy base, and reddened litmus paper, were termed super or acidulous salts, and they had generally an acid taste; such a compound is that called cream of tartar, now termed bitartrate of potash: on the other hand, potash and soda, when combined with the smaller portion of carbonic acid which they are capable of uniting with, were called subcarbonates, because they render turmeric paper of a yellowish-brown colour, thus evincing an alkaline property.

At present the term neutral salt includes such compounds, whatever may be their action on coloured tests, and whatever may be their taste, as are composed of one equivalent of each of their constituents; thus the subcarbonates of potash and of soda are now termed carbonates, notwithstanding their alkaline reaction, because they consist of one equivalent of acid and one of base.

* The above account is taken from the 'Austrian National Encyclopedia,' published at Vienna in 1838: as this was between three and four years after the fire, and several public buildings are specified as having been destroyed (which we have therefore not noticed), it may be presumed that article referred to describes Neustadt as it now is.

NEUTRALIZATION is a term generally applied to the decomposition of the alkaline carbonates, as of potash and soda, by the gradual addition of some acid more powerful than the carbonic, and which of course expels it from the alkaline bases with effervescence. The process of neutralization by means of sulphuric acid is extensively adopted in the process of *alkalimetry*, or of determining the quantity of real alkali which samples of carbonate of potash or soda contain, by means of the quantity of sulphuric acid required to render them neutral to test-papers.

NEUWIED, situated in 50° 25′ N. lat. and 7° 30′ E. long., on the left bank of Rhine, was formerly the capital of a small principality which retained its independence til' 1806, when it was mediatised, and assigned to Nassau. In 1814 it was transferred to Prussia, to which the sovereignty now belongs; it is in the province of the Rhine and government of Coblenz. Neuwied is a very regular well-built town with broad straight streets, and houses all of equal height. It contains 5500 inhabitants, consisting of Roman Catholics, Lutherans, Calvinists, Anabaptists, Moravians, Mennonites, Quakers, and Jews, and among the Protestants a few (about 40) who call themselves 'The Inspired,' and believe in the continued operation of the Holy Ghost: all these sects have their own places of worship. It is the capital of the circle and of the principality, and the residence of the Prince Augustus of Wied-Neuwied, who has a very fine palace with extensive gardens. The palace contains a good library, and an interesting collection of Roman coins, statues, &c. found in the neighbourhood, this having been the site of the standing Roman frontier camp against the Germans. There is likewise the collection of natural history make in Brazil by Prince Maximilian of Wied, and that which he brought from his travels in North America, especially among the Indian tribes of the Missouri and the Rocky Mountains. Among the public institutions there are a seminary for schoolmasters, a pro-gymnasium, a school for mechanics, a society for the education of destitute children, several infirmaries and other establishments for the poor, a house of the Moravian Brethren with a boarding-school for boys and another for girls; five Protestant churches, of which that of the Moravians and that of the Calvinists are the most worthy of notice, a synagogue, and many manufactures. It is the seat of the government of the principality and of many public offices both of the king and the prince. The inhabitants are very active and industrious, and have manufactures of silk, cotton, wool, lace, thread, hats, carpets, leather, tobacco, stockings, and tape; a considerable manufactory of tin culinary utensils, stoves, and also a manufactory of musical clocks. There are breweries, distilleries, vinegar manufactories, and many others. The inhabitants carry on a profitable trade in their own manufactures, and in the products of the country, such as pipe-clay, timber, potash, iron, lead, corn, and wine. A league from the town and close to the Rhine are the ruins of the antient castle of Fredericks-stein, called by the watermen the Devil's Castle. (Stein, Hassel, and Müller's *Handbuch*, 1836.)

NEVA, River. [PETERSBURG.]

NEVA'DA, LA SIERRA (the Snowy Chain), is a chain of mountains in the kingdom of Granada, in Spain, running due east and west, between 37° and 37° 15′ N. lat., and between 3° and 4° W. long. Its length is about 50 miles, and its greatest breadth about fifteen. It attains its greatest altitude in the centre, in the peaks of Mulahacen and Picacho de Veleta, the former being 11,658 feet and the latter 11,382 feet above the level of the Mediterranean. Maladeta, the highest peak in the Pyrenees, being 11,424 feet in height, the Sierra Nevada is, among European mountains, second only to the Alps in altitude. This chain is perpetually covered with snow above the line of 9600 feet. At its base, about 25 miles north-west of the Picacho de Veleta, lies the city of Granada.

The geological composition of the Sierra Nevada has not yet been thoroughly investigated. According to Colonel Silvertop (*Geol. Proceedings*, 1830), this chain consists of a central axis of gneiss and mica schist, with successively overlying zones, on each flank, of transition and secondary rocks, which on the south and along the shores of the Mediterranean are here and there covered with patches of tertiary marine deposits, containing subapennine shells;

whilst on the northern flank of the chain, or toward the interior of Spain, the secondary rocks are succeeded by formations of lacustrine origin. The marbles quarried in the Sierra are much varied in colour, and are esteemed the best in Spain. The most celebrated are those of Lanjarron. On the southern side, in several spots, there are remains of Roman mines, none of which are now worked.

The base of the Sierra is partially clothed with wood on the north, but more abundantly on the south, where the lower slopes are adorned with orange and olive groves, and the vegetation peculiar to the south of Europe. Higher up, the mountains are either bare or scantily clothed with grass and low shrubs, though in a few of the most sheltered valleys are patches of trees and corn-land, surrounding cortijos, or farms. Above the line of perpetual snow, vegetation, with the exception of a few mosses, ceases entirely. The botany of the Sierra is said to consist chiefly of the artemisia glacialis, antirrhinum origanifolium, arenaria tetraquetra, saxifraga tridactylites, festuca ovina, and jasione montana: it is however but imperfectly known; for though Roxas de San Clemente, an eminent native naturalist, spent many years in investigating it, he unfortunately died before he could lay the result of his researches before the world.

The Sierra Nevada is almost uninhabited. The farms before mentioned are very few; they are the abode of the peasants, who tend the horned cattle and goats, which find pasturage in the glens that are watered by the streams of melted snow.

Bears formerly infested these mountains, but they have long been extirpated: wolves still abound: the ibex is said to have been seen, but the fact is doubtful. Game, particularly hares and rabbits, is very plentiful. Eagles, vultures, and ravens, with finches in great variety and abundance, are found in this Sierra.

The vast fields of snow on the summits of these mountains give rise, by their melting, to numerous streams, which impart fertility to the surrounding country. The principal of these is the Xenil, the Singilis of the Romans, which traverses the plain of Granada, and falls into the Guadalquivir at Palma. The snow also not only serves to temper the intense heat of the summer, but yields to the neighbouring cities an inexhaustible supply of ices.

Mulahacen, the higest peak, is inaccessible. The view from the summit of the Veleta is magnificent, embracing the greater part of the province of Andalucia, with parts of Murcia, Valencia, and Castile; the Mediterranean is to the south, bounded by the mountainous coast of Africa at the distance of 180 miles.

The above account is principally the fruit of personal observation.

(Miñano, *Diccionario Geografico-Estadistico de España y Portugal*; Antillon, *Geografia de España y Portugal*; Laborde, *Itinéraire Descriptif de l'Espagne*; Cook's *Sketches in Spain*; Semple's *Journey through Spain*; *Nuevos Paseos por Granada y sus Contornos*.)

NEVERS, a town in France, capital of the department of Nièvre, situated on the Loire, at the junction of the little river Nièvre, in 47° N. lat. and 3° 10′ E. long., 133 miles in a direct line south by east of Paris, or 140 by the road through Fontainebleau, Montargis, and Cosne.

This town existed in the time of the Romans, and appears to have been known to them by the name of Noviodunum, and afterwards of Nivernum, or Nevirnum, from the river Niveris, or Neveris (Nièvre), on which it is situated. It was of little importance until the reign of Clovis, in whose time it belonged to the Burgundians. It afterwards came into the hands of the Franks, and was taken and burnt by Hugues le Grand in his quarrels with Louis d'Outremer. It suffered much in the wars of the English under Henry V. and VI., and in the disputes of the dukes of Bourgogne with the kings of France. In the middle ages it was the capital of the county of Nevers, which was raised by François I. to the rank of a duchy (A.D. 1539). The duchy was sold by Charles III. de Gonzague (Gonzaga), the last duke, to Cardinal Mazarin, and was, a few years afterwards (A.D. 1665), united to the crown of France. It constituted the province of Nivernois.

Nevers is situated on a slope on the banks of the Loire. This situation gives the town a fine appearance from a distance, but renders the streets inconveniently steep: they are also crooked and ill-paved. The houses are irregularly built, but there are some good ones. There are some remains of the old walls and towers of the city. The chief public buildings are the cathedral, which owes more to its situation on the crown of the hill whereon the city is built, than to its architecture. The tower, which is square, and richly adorned with statues and sculpture, is the finest feature of the building. The old castle of the dukes of Nevers is also in the upper part of the city. There are barracks, an arsenal, and an ex-episcopal palace, now occupied by the prefect of the department. There is a public walk attached to the ducal castle, and a triumphal arch at the entrance of the town from Paris, bearing a pompous inscription.

The population of Nevers in 1826 was 15,782 for the commune; in 1831, 11,868 for the town, or 15,085 for the whole commune; in 1836 it was 16,967 for the commune. The inhabitants of the town and neighbourhood manufacture iron-wares of massive character, cannon and shot, chain-cables, anchors, chains for suspension bridges, &c. Some of the iron-works belong to government. The principal forges are at Guerigny, on the Nièvre, seven or eight miles from the town: they furnish employment to 400 or 500 workmen. Besides these larger wares, agricultural implements, files, and other tools are made; also earthenware, porcelain, enamel, cordage, violin-strings, glue, &c. There are dye-houses, glass-houses for bottles, and tan-yards. There is a commodious port for the river craft at the mouth of the Nièvre, and considerable trade is carried on in iron and steel, wood, coal, wines, leather, cattle, and manufactured goods. There are nine yearly fairs. There are at Nevers two seminaries for the priesthood, a high school, a school of linear drawing, a school of geometry and mechanics applied to the arts, a free-school for the arts, a public library of 7000 volumes, several hospitals, and a theatre.

Nevers is the seat of a bishopric; the diocese includes the department of Nièvre, and the bishop is a suffragan of the archbishop of Sens and Auxerre.

The arrondissement has an area of 875 square miles, and comprehends ninety-nine communes: it is divided into eight cantons or divisions, each under a justice of the peace. The population, in 1831, was 86,847; in 1836, 94,382.

NEVIS, one of the Lesser Antilles, in 17° 14′ N. lat. and 63° 3′ W. long., is separated from the south side of the island of St. Christopher by a channel about two miles wide, called the Narrows, which is navigable only by small boats owing to the numerous shoals in it. Nevis consists of a single conical mountain, of volcanic origin, rising at first with a gentle ascent from the sea-shore, and having its summit perpetually covered with clouds. The circumference of the island is about 24 miles, and its greatest elevation 2500 feet above the sea. The soil is for the most part a tenacious marl, and is very fertile. On the western side are two small streams. The sides of the mountain are covered with plantations, but the higher parts are rocky and sterile. The town, Charlestown, stands near the south-west end of the island, and has a tolerable roadstead, but it is somewhat difficult of approach on account of a shoal which stretches off the shore to the distance of half a mile. There has been no census of the population for a great number of years. The estimated number of inhabitants in 1836 was 9250, only a small proportion of whom were whites. The number of slaves on the island on 1st August, 1834, was 8815, for whom compensation was paid to their owners out of the parliamentary grant to the amount of 151,006*l.*, being at the rate of 17*l.* 2*s.* 7*d.* per head. Of this number, 5123 were attached to plantations, 176 were mechanics employed in the country, 1207 were domestic servants, 719 were mechanics employed in the town, 1261 were children under six years of age, and 329 were aged and diseased persons.

The exportable produce of Nevis consists almost wholly of sugar, molasses, and rum. The quantity of each of these articles exported in 1836 was 2,724,836 lbs. sugar, 37,120 gallons molasses, and 12,290 gallons of rum. The total value of the exports in that year was 34,885*l.*, and that of the imports—consisting chiefly of plantation stores, was 32,511*l.* The shipping by means of which this trade was conducted, and the countries from and to which the vessels proceeded, were as follows:—

Countries.	Inwards. Ships.	Inwards. Tons.	Inwards. Men.	Outwards. Ships.	Outwards. Tons.	Outwards. Men.
Great Britain	6	1372	..	6	1435	..
British Colonies	158	4857	..	180	5322	..
United States of America	6	698	..	6	698	..
Foreign States	75	1560	..	58	1291	..
Total	245	8487	1094	250	8746	1134

The island is divided into five parishes. It has a local legislature, consisting of a council, of eleven, and a House of Assembly, of fifteen members. Nevis was first colonised by the English in 1628; it has always followed the political fortune of the island of St. Christopher.

NEW BEDFORD. [MASSACHUSETTS.]

NEW BRANDENBURG is a pretty town in the grand-duchy of Mecklenburg-Strelitz. It is built nearly in the form of a circle, with broad straight streets, and stands in a pleasant country on the banks of a small river near the lake called the Tollensee. The grand-duke has a palace in this town, which also contains a gymnasium and several schools. The inhabitants, above 6000 in number, live partly by agriculture, partly by trade and manufactures. There are many brandy distilleries, manufactories of woollen cloths, playing-cards, paper, snuff and tobacco, and chemicals. Calico-printing is carried on to some extent. The Mecklenburg insurance-offices of household furniture against fire, and of the standing crop against damage done by hail, are in New Brandenburg. In each of these property to the amount of a million sterling is insured. There is a well attended annual wool-fair, and celebrated horse-races, which attract a great concourse of the lovers of those sports. Considerable quantities of tobacco and hops are grown in the surrounding country. About two miles from the town the grand-duke has a handsome country seat called the Belvedere, with grounds laid out in the English style.

NEW BRITAIN is a large island in the Pacific, situated between 5° and 7° 30′ S. lat. and 148° and 153° E. long. Up to the year 1700 it was considered a part of New Guinea, or Papua; but in that year Dampier discovered the strait which separates both islands, and is still called after his name. This strait is about 40 miles wide. New Britain is separated by St. George's Channel from the island of New Ireland. New Britain is of a very irregular figure, and its southern shores have a coast-line of more than 350 miles. The surface is estimated at 24,000 square miles, or nearly half the extent of England. The interior of the island contains mountains of great elevation, as may be inferred from their being seen from sea at a great distance. Carteret observed smoke to rise from the highest summit. In several places the mountains come close to the sea, as at Cape Gloucester. Along the shores there are several plains of considerable extent, and also some good harbours. The declivities of the mountains are generally covered with trees. The island is fertile, and produces the cocoa-nut, sago, and other kinds of palms; also bananas, yams, ginger, sugar-cane, the bread-tree, bamboo, and many other plants and trees. Dogs, pigs, turtles, and fish abound. The inhabitants, who appear to be rather numerous, belong to the race of the Australian negroes, but rather resemble the inhabitants of Papua, or New Guinea, than those of Australia or Tasmania. They are stout and well made, of a very dark colour, with curly hair, and go naked. They are courageous and fond of war.

(Dampier's *Voyages and Travels;* Carteret's, D'Entrecasteaux's, and Dumont d'Urville's *Voyages round the World.*)

NEW BRUNSWICK, a British colony in North America, lies between 45° and 48° 5′ N. lat. and 63° 48′ and 67° 53′ W. long. It is bounded on the north by the Bay of Chaleurs, and by the river Ristigouche, which in its whole course from its source to its æstuary in the Bay of Chaleurs separates this country from Lower Canada. On the east it borders on the Gulf of St. Lawrence, Northumberland Strait dividing it from Prince Edward Island; and on Nova Scotia, with which it is connected by the isthmus of Chignecto, which separates Northumberland Strait from Chignecto Bay, and is only ten miles wide. On the south it is washed by the Bay of Fundy. On the west it borders on the state of Maine, from which it is separated by a line beginning at Passamaquoddy Bay, and running along the course of the St. Croix river to the mouth of the Scodie river, whence it continues along the course of the Chiputnaticook and the lakes, in which the last-mentioned river originates. The remainder of the western boundary is formed by an imaginary line extending along the meridian of 67° 53′ W. long., and separating New Brunswick from the northern part of Maine and Lower Canada. Its surface is estimated at 25,324 square miles, or about half the area of England, without Wales.

Surface and Soil.—New Brunswick may be divided into three regions, the Southern, Central, and Northern region. The *Southern* region comprehends the country along the Bay of Fundy, and from 40 to 50 miles inland, and is divided from the Central region by a line drawn from the lakes of Chiputnaticook eastward to Bear Lake and the St John river, which it intersects at the outlet of Washademoak Lake, and then continues along that lake and the river of the same name to the sources of the river Petcoudiac; it follows the course of this river to its mouth in Shepody Bay, a branch of Chignecto Bay. This region is divided into two unequal portions by the St. John river. The western section contains the greatest part of Passamaquoddy Bay, an extensive sheet of water, branching out into several inlets, and forming harbours for vessels of considerable size. It receives many rivers, of which the St. Croix is the most important, being navigable for large vessels to St. Stephen's, above which place it is interrupted by falls, yet timber is floated down. Passamaquoddy Bay contains several islands: Campobello, ten miles long and two wide, is separated by a narrow deep channel from Maine; and Deer Island is nearly seven miles long and three miles broad in the widest part. Before the bay lies Grand Manan Island, about fourteen miles long and six or seven wide. The coast of this section is everywhere rocky, but it does not rise to any considerable height. The surface is much broken, but as the rocks which constitute the substratum of the soil are generally covered with a deep layer of earth, it is clothed with high forest trees, and when cultivated yields good crops of grain. The most elevated part of this tract is intersected by several lakes, some of considerable extent, and probably 600 or 700 feet above the sea-level. That part of the Southern region which lies east of the St. John river is rather rocky and sterile. The rocky and elevated coast runs off in an almost continuous line, without any considerable break, so that the inlets along it may rather be called coves than harbours. At the back of this iron-bound coast the country rises with a rather steep ascent, and then extends in an uneven and broken plain, on which several hills rise to some elevation. The soil of this tract is very stony, and generally shallow. In its natural state it is chiefly covered with low trees, which do not supply timber. When cultivated it produces moderate crops of rye, barley, oats, and potatoes, but not wheat. There are however in this tract several depressions, extending in a longitudinal direction, and constituting valleys, in which the rivers flow, mostly to the St. John river. The lower part of these valleys is occupied by lakes, as Kenebekasis, Belleisle, and Washademoak. In the inner recesses of these lakes fine valleys begin, and extend many miles upwards along the rivers. These valleys are covered with large timber-trees, and when cultivated produce excellent crops of grain. In climate this tract differs from the country farther northward, being somewhat less cold, but much more humid, and exposed to thick and frequent fogs when the winds blow from the Atlantic. This circumstance, added to the strong tides in the Bay of Fundy [FUNDY], and the rocky iron-bound coast, renders the navigation very perilous, which disadvantages are hardly compensated by the harbours of this coast, especially those in Passamaquoddy Bay, being less encumbered with ice in winter than those of New England, and being accessible nearly all the year round.

The *Central* is divided from the Northern region by a line beginning on the west on the banks of the St. John river at Presqueisle, and running thence in a north-eastern direction to the mouth of the Little Nipisighet river in the Bay of Chaleurs. The shores of this region are low, and the rivers have sand-bars across their entrance, though there is usually a considerable depth of water on them. In many places the shores are fringed with sandy ridges or small islands, which produce only bent-grass, and within these islands are lagunes with shallow entrances. There are no deep harbours except at the mouths of the rivers. The level country, which extends several miles inland, has a sandy soil, and is clothed with dwarf spruce and birch trees, but it makes pretty good pasture-ground. The country begins to rise at from twelve to twenty miles from the shores, and continues to rise till about sixty miles, where it begins to descend rather rapidly towards the St. John river at a distance of about thirty miles from its banks. This more elevated tract has an uneven surface, extending in long broad-backed ridges, most of which run east and west. Hills occur in several places, but they do not attain a great elevation, and have generally gentle slopes. Their whole surface is still

covered with a continuous forest of heavy timber, the vigorous growth of which indicates a fertile soil. Along the banks of the St. John river extends a flat country, which on the east begins at the mouth of the Washademoak, and extends westward to Meductic, and thence northward to Presqueisle. The eastern portion is nearly a level, and contains the most fertile and best settled part of the colony; from Meductic northward its surface is undulating and even hilly, and though the soil seems not so good, it is covered in most parts with heavy timber.

The *Northern* region is very hilly, and even mountainous, especially on the banks of the river Ristigouche, and in that tract where the rivers Tobique and Nipisighet originate. The latter seems to form an elevated tableland, thickly studded with lakes. The interior of this region is very little known, with the exception of the tracts bordering on the river Tobique, which are covered with the finest forests of red pine, and furnish nearly all the timber which is exported from St. John. No settlements have yet been established, except on the Bay of Chaleurs, and the inhabitants live almost entirely on the produce of their fishing.

Rivers.—The largest river is the Looshtook, or St. John river, which rises far in the west, and flows for above 200 miles through Lower Canada. [CANADA.] It enters New Brunswick near 47° N. lat., and soon afterwards forms the Great Falls. By the most northern fall the river descends from 45 to 50 feet perpendicular. This is followed by some smaller falls, so that in half a mile the water descends 75 feet. Up to the foot of these falls the river is ascended by flat-bottomed boats of 20 tons burden. Below the falls the river often runs between abrupt banks, and its rugged bed renders navigation dangerous in many places. Several rapids occur, of which the most difficult are the rapids called Meductic Falls, situated where the river begins to run eastward. The last of these rapids occurs 6 or 7 miles above Fredericktown, at Sarayo Islands. Where the river bends again to the south it is connected, by narrow channels, with several lakes, among which the largest is Grand Lake, whose channel joins it opposite Gagetown. This lake is 30 miles long and about three miles wide. The other lakes, Washademoak, Belleisle, and Kenebekasis, are somewhat smaller. All of them are navigable for sloops, as well as the rivers which fall into them. Sloops can ascend the St. John river to Fredericktown. About a mile above the town of St. John are the Rugged Narrows, where the river is interrupted by huge rocks, over and among which the waters roll and foam, and which render the navigation, except for four short diurnal periods, impracticable. The great rise of tide, which here attains from 25 to 30 feet, so far overflows these rapids that when the flood rises 12 feet at the foot of the town, sloops and schooners pass in safety for about 20 minutes, and for the same time when the tide ebbs to 12 feet. At Fredericktown the tide rises from 6 to 10 inches, and it is perceptible as high as the mouth of Keswick river. The whole course of the St. John river exceeds 400 miles, of which 220 lie within this colony.

The Petcoudiac, which falls into Shepody Bay, the western branch of Chignecto Bay, is about 70 miles long, and the tide flows up 40 miles. Ships occasionally proceed as far as Dorchester for timber; but the impetuous tides of the Bay of Fundy render the navigation difficult. The Miramichi, the most important river next to the St. John, drains the centre of the Central region with its numerous upper branches, and falls into the Gulf of St. Lawrence, after a course of more than 100 miles; it is navigable for large ships for about 40 miles. There is a sand-bar across its entrance, but the channel over it is broad, and has water for ships of from 600 to 700 tons. The Nipisighet river, which drains the Northern region, and runs nearly 100 miles, is much broken by falls and rapids, and does not appear to be navigable for any extent.

Climate.—The climate of this colony rather resembles that of the countries along the southern shores of the Baltic, than that of England. The spring is short, lasting only from the middle of April to the middle of May, and is characterised by raw weather. About the middle of May the summer sets in, and continues to the beginning or middle of September. The weather is warm, and rain not frequent, except during the thunder-storms, which are frequent. In September and October the weather is fine and pleasant, but in the two following months raw, and rain is very frequent. At the end of December or beginning of January, the frost, which frequently is felt before, but only at intervals, becomes continual, and lasts to the end of March or the middle of April. The rivers generally break up about that time, so that the winter may be considered as lasting four months. The winter is colder and the summer hotter than under the same parallels of latitude in Europe; the daily variations of temperature are also greater, but the transitions from dry to wet weather are by no means so sudden as in England. The winds are subject to sudden and frequent variations, and as the temperature of the air depends on them, the variations of the atmosphere are as sudden. Northern and southern winds are rare. South-west winds prevail in summer and autumn. Westerly winds are, throughout the whole year, more frequent than any other. North-westerly winds are cold and dry; the winds from the north-east and east bring on snow-storms in winter, sleet and wet weather in spring, and heavy rains in summer and autumn. In July the thermometer rarely rises above 90° and in January it rarely sinks below 10° of Fahrenheit.

Productions.—The great commercial wealth of this country consists in its extensive forests, which are composed of pine, fir, spruce, hemlock, birch, beech, maple, ash, elm, and poplar; oak is also found, but it is not common. Pine is by far the most valuable for commercial purposes. Wheat, rye, oats, barley, beans, peas, buckwheat, and flax are cultivated with success, and Indian corn in the southern districts. Potatoes and the common esculent roots and vegetables are also grown. On the alluvial grounds which occur along the banks of the numerous rivers there are fine meadows and pasture-grounds. Apples, plums, and cherries grow well, but not the other fruit-trees of England.

Wild animals are by no means numerous, though there are still bears, wolves, foxes, racoons, minks, squirrels, and beavers: the moose deer is nearly extinct. Wild geese, ducks, partridges, and pigeons are the most common game. The rivers abound with salmon, eel, trout, perch, &c., and the sea near the shores with cod, haddock, mackerel, and herrings. A large number of families, settled in the country north of the mouth of the Miramichi river, gain their livelihood by fishing cod, mackerel, and herrings; the cod is sent to Spain and Italy.

The mineral riches are imperfectly known. Marble abounds on the banks of the lake Kenebekasis, and coal on those of Grand Lake, where it is worked. Iron-ore is said to be abundant. Gypsum occurs in large quantities all along the shores of the Bay of Fundy, and is exported to the United States, as well as grindstones, which are quarried in the vicinity of Shepody Bay.

Inhabitants.—The number of natives or Indians is very small. A few families belonging to the Mic-mac are found in the neighbourhood of the Bay of Chaleurs, and a somewhat larger number of Etchemins live in the forests and on the banks of the rivers above the Great Falls of the St. John river. It is curious that in a country so newly settled, and of which so small a portion is under cultivation, the aborigines should be so few. It appears indeed that they have never been numerous. These natives do not cultivate the ground; they live on the produce of their fishing and hunting, and pass continually from one river or lake to another. A number of families, settled mostly on the shores of the Bay of Chaleurs, are of French origin, or Acadians; the remainder are of British origin.

Towns.—Fredericktown, the capital, is built on the banks of the St. John river, 85 miles from its mouth, on a flat, surrounded by the river on two sides. Vessels of 50 tons burden may ascend to this town. The streets are regular, but the houses chiefly of wood. It contains a good government-house, and several other public buildings. The population is about 3000. St. John, the principal trading-place, has above 10,000 inhabitants; it is situated near the mouth of the St. John river, on the southern declivity of a peninsula, and on rocky and very irregular ground. It contains several good public buildings. St. Andrew's, a thriving place at the mouth of the St. Croix river, in Passamaquoddy Bay, has 3000 inhabitants. Newcastle, on the banks of the Miramichi, about 20 miles from its mouth, is a thriving place, well situated for the exportation of timber. (M'Gregor's *British America;* Bouchette's *British Dominions in North America.*)

The population of the colony, according to the latest census, taken in 1834, was as follows:—

District or County.	Sq. Miles.	Males.	Females.	Total.	Families.	Houses.
York	3,440	5,437	5,041	10,478	1,698	1,502
Carleton	4,050	4,984	4,509	9,493	1,542	1,419
St. John	636	10,389	10,279	20,668	3,630	2,188
King's County	1,328	6,305	5,890	12,195	1,926	1,849
Queen's County	1,502	3,727	3,477	7,204	1,175	1,056
Sunbury	1,224	2,061	1,777	3,838	695	505
Westmoreland	2,050	7,323	6,882	14,205	2,272	2,017
Northumberland	5,000	6,008	5,162	11,170	1,777	1,560
Kent	1,260	3,202	2,829	6,031	971	884
Gloucester	3,600	4,706	3,617	8,323	1,316	1,155
Charlotte	1,224	8,371	7,481	15,852	2,443	2,349
Total	25,324	62,513	56,944	119,457	19,345	16,434

In collecting the above numbers distinction was made between males and females who were above or under the age of 16, from which it appeared that there were—

	Males.	Females.	Total.
Above 16	32,845	28,291	61,136
Under 16	29,381	28,403	57,784
Age not ascertained	287	250	537
	62,513	56,944	119,457

The number of emigrants that arrived in the colony in each year, from 1832 to 1836, was as follows:—

1832	6929
1833	3952
1834	7717
1835	3307
1836	5886

The militia returns of 1836 comprise 51 field-officers, 300 captains, 580 subalterns, 471 serjeants, 26 drummers, and 19,260 rank and file; in all 20,688.

The home government and the local legislature have been alike mindful of the subject of education. King's College in Fredericktown is endowed by royal charter, and receives out of the crown revenues the yearly sum of 1000*l.*, in addition to 990*l.* from the provincial treasury, and 180*l.* arising from rent of lands with which the college has been endowed. There are no late returns of the number of students. In connection with the college and supported out of its funds is a grammar-school, conducted on the same plan as the school of Eton College, in which 61 scholars are taught. By an act of the provincial legislature, 90*l.* per annum are appropriated to the support of a grammar-school in each county of the province, on condition that the inhabitants subscribe 45*l.* per annum in addition. Under this act eight grammar-schools are supported in as many of the counties. Carleton and Gloucester are the only counties in the province without a grammar-school. Another act of the provincial legislature provides for the support of parish schools to the number of seven in a parish, by the grant of 20*l.* colonial currency per annum to each school, provided the inhabitants subscribe an equal sum and erect a school-house. Under this act there were, in 1836, throughout the province 480 schools, in which 6424 boys and 5078 girls received instruction. In addition to the schools thus established and endowed by the legislature there are numerous private schools, but no returns respecting them have been made.

For the religious instruction of the inhabitants there are appointed 24 rectors and 6 curates belonging to the Church of England; 10 clergymen in connection with the Church of Scotland; 14 preachers, who officiate by turns in 28 chapels belonging to the Wesleyan Methodists, besides Baptists, Independents, and Roman Catholic preachers.

The exports of the province are almost wholly confined to the produce of the forests and the fisheries. Out of 547,720*l.*, the total value of exports in 1836, the forests supplied to the amount of 475,431*l.*, and the fisheries 35,943*l.*, the remaining value being made up of coals, gypsum, corn, and provisions, and sundry articles re-exported. The value of imports during the same year was 863,783*l.*, of which grain and salt provisions amounted to 146,045*l.*; articles of apparel and woven goods to 314,334*l.*; metals and hardwares, 91,052*l.*; cordage, glassware, earthenwares, and other British manufactures, 87,937*l.*; colonial produce, 88,374*l.*; and the residue was made up of articles of foreign growth and production. The imports into the province are always to a larger amount than the exports, which must partly arise from the capital conveyed to it by settlers from the mother-country. The excess of imports during the five years from 1832 to 1836 was 577,087*l.*, which is somewhat more than 20*l.* for each emigrant that landed.

The shipping that entered and cleared during 1836 was as follows:—

	Inwards. Ships.	Inwards. Tonnage.	Inwards. Men.	Outwards. Ships.	Outwards. Tonnage.	Outwards. Men.
From and to—						
Great Britain	612	157,862	..	688	219,259	..
Brit. colonies	1918	118,394	..	1789	108,435	..
United States	543	56,626	..	318	18,670	..
Foreign states	19	4,178	..	6	671	..
Total	2992	337,060	16,462	2801	347,035	16,059

Ship-building forms a considerable branch of industry in the province; and as many of the vessels constructed there are sold after discharging their first cargoes in British ports, their value in part makes up for the excess of imports as above described, but to what extent this kind of remittance is made there are no means of knowing. The number of ships built, with their tonnage, in the five years from 1832 to 1836, was as follows:—

Years.	Ships.	Tons.
1832	55	17,465
1833	97	17,837
1834	92	24,140
1835	94	23,058
1836	89	27,826

The amount of shipping that belonged to the province in 1836 was 587 vessels, of 84,425 tons, navigated by 3658 men.

The administration of the government of New Brunswick is confided to a lieutenant-governor (who is subordinate to the governor-general of the British provinces in North America), an executive and legislative council, of 12, and a House of Assembly, of 28 members. For the dispensing of justice there is a supreme court, with a chief-justice and three puisne judges. There are also a court of chancery, a vice-admiralty court, and a court for the probates of wills and granting of administration to intestates.

The public revenue of the province in 1836 amounted to 58,627*l.*, and was derived from the following sources:—

Specific duties on spirits, sugar, coffee, dried fruits, cattle, and ad valorem duties on the importation of manufactured goods	£49,728
Duties on sales by auction	1,545
Hawkers' and pedlars' licences	103
Customs' duties, levied under acts of the imperial parliament, transferred to the local treasury	7,251
	£58,627

The provincial expenditure during the same year was 52,414*l.*, under the following heads:—

Collection of revenue	£3,227
Allowances to members of the legislature and expenses of legislative bodies	5,017
Dispensation of justice	484
For purposes of education	9,940
Bounties	232
Construction and repairs of roads and bridges	21,534
Construction and repairs of public buildings	3,535
Expenses of militia	910
Post-office charges	324
Relief of emigrants and other charitable objects	1,117
Miscellaneous charges	6,094
	£52,414

In addition to the foregoing, various expenses are defrayed by Great Britain. The sums thus paid, in 1836, were:—

For the civil and ecclesiastical establishments	£9,054
For the judicial establishment	3,835
Miscellaneous expenditure	150
	£13,039

NEW CALEDONIA, an extensive island in the Pacific, is situated between 17° 57′ and 23° S. lat., and between 163° and 168° E. long. This island extends from north-west to south-east more than 400 miles, but is of inconsiderable width. In the broadest part it is hardly 60 miles wide. On all sides it is enclosed by coral-reefs, which

connect innumerable small sandy islands or cliffs. These reefs extend in some places more than 50 miles from the shores, but they generally occur at a distance of from 4 to 10 miles from the coast. Hitherto only two openings have been found in these reefs by which the island can be approached by vessels. There are only two harbours in which large vessels can anchor with security; on the north-eastern shores, Port Balade, and on the south-western, Port St. Vincent. From the shores the country gradually rises inland to a mountain-range which traverses the island in all its length, and rises in some parts to 2000 or 3000 feet above the sea. This island is less fertile than most other islands of the Pacific. The declivities of the hills are partly bare and partly covered with coarse grass and low trees. Some flats along the shores are swampy; but others, as well as the valleys, have a fertile soil. The inhabitants live mostly on yams and fish. The sugar-cane and banana are cultivated to some extent. Cocoa-nut palms, bread-fruit-trees, and mango-trees abound on the shores. Among other minerals, a kind of steatite is found, which is eaten by the inhabitants, who belong to the race of the Austral negroes. They are stoutly made, have black and curly hair, and a very dark colour. They eat their enemies. Cook, who discovered this island in 1774, found them good-natured and friendly; but the French give a different account of their character. They speak a language which differs from that of the neighbouring islands, but it is supposed that it will be found to be only a dialect of the language spoken in Papua and New Britain.

(Cook's and D'Entrecasteaux's *Voyages*, and Krusenstern's *Mémoires*.)

NEW COLLEGE, Oxford, was founded in 1386, by William of Wykeham, bishop of Winchester and lord-high-chancellor of England, for a warden, seventy fellows and scholars, ten chaplains, an organist, three clerks, and sixteen choristers. The fellows and scholars are elected from the college of Winchester, where an election is held annually by the wardens of both colleges, two fellows of New College, and the sub-warden and head-master of Winchester College, to supply the vacancies which may happen in the course of the ensuing year at New College. The founder's kindred are actual fellows on their first admission, the others are scholars on probation till the expiration of two years. The visitor is the bishop of Winchester. The election from the college of Winchester usually takes place in the second week of July.

Of the benefactors to New College after its establishment, one only appeared during the founder's lifetime, John de Buckingham, bishop of Lincoln, who gave to the society the advowson of Swalcliffe church and some lands adjoining. Thomas Beckington, bishop of Bath and Wells, in 1440, Thomas Jane, bishop of Norwich, in 1494, and archbishop Warham, in 1509, were also contributors of landed property. John White, bishop of Winchester, was a benefactor in 1558.

The rectories of Akeley, Hardwick, Harwood Magna, Newton Longville, Radclive, and Tingewick, and the vicarage of Whaddon, in Bucks; the vicarage of Steeple-Morden in Cambridgeshire; the rectory of Abbotstoke in Dorset; the rectories of Birchanger and New Stampford, with the vicarage of Writtle with Roxwell chapel, and the chapelry of Rumford, in Essex; the vicarage of Marshfield in Gloucestershire; the vicarage of Hackfield with the chapelry of Mattingley in Hants; the rectories of Saham Tony, All Saints Stratton, St. John Madder-market in Norwich, and Weston Longville, and the vicarage of Witchingham, in Norfolk; the rectory of Paulespury in Northamptonshire; the rectories of Bucknell, Heyford Warren, Stanton St. John, and Wootton, with the vicarages of Adderbury and Chesterton, and the vicarage of Swalcliffe with Epwell chapelry, in Oxfordshire; the rectory of Worthingham with the chapelry of Wolston in Shropshire; the rectory of Long Ditton in Surrey; the rectory of Stockton in Warwickshire; and the rectories of Alton Barnes, St. John Berwick, Colerne, and Donhead St. Mary's, in Wilts, form the list of preferments in the college patronage.

Among the prelates educated in New College are Chichele and Warham, archbishops of Canterbury; bishop Beckington, already mentioned; Kenn, bishop of Bath and Wells; and bishop Lowth. Among the other scholars educated in the college may be named—Philpot, one of the first martyrs in Queen Mary's reign; Nicholas Harpesfield; Sir Henry Sidney, the father of Sir Philip; Pits, the biographer; Herbert, earl of Pembroke; Wood, the author of the 'Institutes of the Laws of England;' Somerville, the poet; Smith, the translator of Thucydides; and Dr. Robert Holmes, the collator of the 'Septuagint.'

Most of the buildings of the founder in this college, after a lapse of more than four centuries, remain substantially entire. His whole design may be still traced throughout and the hall, chapel, cloisters, groined gateways, and even the original doors and windows, in many instances, remain undisturbed. The chapel was restored by Wyatt in 1789, and is rich both in antient and modern painted glass: the west window, painted by Jervais from finished cartoons furnished by Sir Joshua Reynolds, and begun in 1777, is considered one of the finest works of art in Oxford: the other windows of the antechapel exhibit the original glass of the founder's time. The tower of this college, a pattern of massive strength, and one of the great features in the general view of Oxford, stands on the site of one of the bastions of the old city wall. The more recent buildings in what is called the garden court of the college were finished in 1684.

Among the curiosities preserved in this college is the superb and costly crozier of the founder, of silver, gilt and enamelled. Some of the ornaments of his mitre, his gloves, and ring, are also preserved in the muniment-room.

On the 31st December, 1839, there were 169 members upon the books of this college. (Gutch's *Colleges and Halls of Oxford*; Chalmers's *Hist. of the Colleges and Halls*; Ingram's *Memorials of Oxford*; *The Oxford Univ. Calendar*, 1839.)

NEW ENGLAND. [ENGLAND, NEW.]

NEW FOREST, situate in that part of Hampshire which is bounded on the east by Southampton river, and on the south by the British Channel, is the only forest belonging to the crown of which the origin is known. Domesday Book contains a distinct account of its afforestation, and the formation of it has added much to the load of reproaches laid on the memory of William the Conqueror. Our historians concur in accusing him of laying waste the country in Hampshire to a very large extent, of expelling the inhabitants from their houses, seizing their property, and even destroying churches, without giving the sufferers any compensation. Knyghton, who makes William Rufus a partner in the devastation with his father, represents opinion to have varied as to the number of churches destroyed, from twenty-two, beside dependent chapels, to fifty-two. (Twysd., *Script. Decem.*, col. 2354, 2373.) The fact of the destruction is allowed by the Conqueror's own chaplain, William of Jumieges, who, speaking of the deaths of William Rufus and his brother Richard, in the forest, says, 'Ferunt autem multi, quod ideo hi duo filii Willielmi Regis in illa silva judicio Dei perierunt: quoniam multas villas et ecclesias, propter eandem Forestam amplificandam, in circuitu ipsius destruxerat.' (*Hist. Norm. Script.*, fol., par. 1619, p. 296.)

Gough, in his edition of Camden, and Warner, in his 'Topographical Remarks relating to the South-Western parts of Hampshire' (8vo. London, 1793, vol. i., p. 182-189), gave, each, a tabular estimate of the amount of injury which William was supposed really to have occasioned to the population and agriculture of this part of England by the afforestation, abstracting the quantity of land in hides, virgates, and acres, with the respective values of the different allotments of property in the Confessor's and the Conqueror's reigns; A third tabular arrangement was made by the late Rev. William Bingley, among his preparations for a history of Hampshire. As a resident in the forest, Mr. Bingley had better opportunities than either Gough or Warner for comparing the text of the record of Domesday with the face of the county; and it appears from his tables that at least a hundred and forty hides had been afforested between the time of Edward the Confessor and that of the survey. These, reckoning four virgates in each hide, and thirty acres to make a virgate, amount to nearly seventeen thousand acres. Gough's table was the least extensive of the three already mentioned; it took in only that part of the survey which in itself purported to relate immediately to the New Forest and its environs, and omitted all the other parts of the survey of the county in which lands are stated to have been afforested: thus reducing the quantity of land really added by the Conqueror almost one half.

In justice to the Conqueror's memory however it should be stated that an anterior forest certainly existed here, and

is mentioned by several writers under the name of Ytene. The Conqueror enlarged its circuit to the extent stated, and gave it a fresh name, thus ensuring to himself a lasting reproach. Domesday Book is the earliest record which designates this tract as the *New Forest*. The destruction of numerous habitable places within its limits is evident from the names of many of them terminating in *ham* and *ton* or *tune*: as Truham, Greteham, Adlingeham, Wolnetune, Bermintune, and others, all indicating former villages or hamlets. Mr. William Stewart Rose, in the notes to his Romance of 'The Red King,' enumerates others, and refers to different spots within the present circuit of the forest where the ridges and inequalities of surface, and the fragments of building materials found upon digging within them, show marks of former foundations.

The oldest perambulation of this forest now preserved is in the Chapter-house at Westminster, of the 8th Edward I., the boundaries described in which include all the country from Southampton river on the east to the Avon on the west, following the sea-coast as the southern boundary between those rivers, and extending northwards as far as North Chardeford, or North Charford, on the west, and to Wade and Orebrugge, or Owerbridge, on the east. Another perambulation was made in the 29th Edward I., which leaves out a great part of the country contained in the former. This perambulation is preserved among the records in the Tower, and confines the forest to limits which appear to have been followed in the 22nd Charles II., when the forest was again perambulated. By the Charta de Foresta, all lands not belonging to the crown which had been afforested by Henry II., Richard I., or King John, were to be disafforested; but as no provision was made for the reduction of the more antient afforestations, it is not easy to account for the great diminution of this forest in the reign of Edward I., who was not a prince likely to submit to any encroachment on his rights.

The perambulation of the 22nd Charles II. is the last on record, and contains the present legal bounds of the forest. According to this perambulation the forest extends from Godshill on the north-west, to the sea on the south-east, about twenty miles; and from Hardley on the east to Ringwood on the west, about fifteen miles; and contains within those limits about 92,365 acres statute measure. The whole of that quantity however is not forest land, or now the property of the crown; there are several manors and other considerable freehold estates within the perambulation belonging to individuals, to the amount of 24,797 acres; about 625 acres are copyhold, or customary lands, belonging to her majesty's manor of Lyndhurst: about 1004 acres are leasehold, under the crown, granted for certain terms of years, and forming part of the demised land revenue, under the management of the office of woods and works; about 901 acres are purprestures, or encroachments on the forest; about 1193 acres more are enclosed lands, held by the master-keepers and groom-keepers, with their respective lodges; and the remainder, being about 63,845 acres, are the woods and waste lands of the forest.

In each species of the property above mentioned the crown has different rights or interests.

By an act passed in the 9th and 10th Will. III., for improvement of this forest, certain rights of common, of pasture, pannage, and fuel, claimed by the proprietors of estates within or adjacent to the forest, under certain limitations, were saved and reserved to them, and the rights of the crown were defined and ascertained.

By that act the crown was empowered to enclose two thousand acres of the waste lands of the forest; one thousand acres forthwith, and the remaining thousand immediately after the first session of parliament after the year 1699; and also two hundred acres more yearly for twenty years following, making in all six thousand acres, 'to remain in severalty in the actual possession of the crown for ever, freed and discharged from all manner of right, title, and pretence whatsoever, and to be called, made, and kept a nursery for wood and timber only;' and the crown was likewise empowered, so soon as the trees in all or any part of such enclosures should be past danger of being hurt by cattle or deer, to throw open the same, and in lieu thereof to enclose an equal quantity in any other part of the forest; keeping in this way six thousand acres constantly enclosed as a nursery for timber. The crown has also a right to keep deer on the unenclosed part of the forest at all times, without any limitation or number.

By the same act it was provided 'that all persons having any right of pasture or pannage, or any privileges within the forest, should hold and enjoy the same; that is to say, their right of pannage between the 14th of September and the 11th of November yearly (old style), and their right of common of pasture in and through the waste grounds of the forest, at such time and times as the same should not be enclosed, the time of the fence-month (that is to say, fifteen days before and fifteen days after Midsummer, yearly), and the time of winter haining (that is to say, from the 11th of November to the 23rd of April yearly, old style), excepted, under and subject to the forest laws; saving also to the several adjacent inhabitants their antient right of fuel, provided that such inhabitants should not sell or otherwise dispose of any part thereof, nor that any person or persons presume to receive or take the same in other manner than they ought, nor by reason of any claim or pretence of any right that was not allowed, according to the laws of the forest before the 27th year of queen Elizabeth.'

The right to fuel-wood is limited and ascertained by a decree of the Court of Exchequer, dated the 19th of June (26th Eliz.), by which it was ordered 'that no inhabitant of any house newly built, since the beginning of the queen's reign, should be allowed any wood in the said forest to be spent in any such new-built house.' This has ever since been held to be the rule for judging whether the inhabitant of any house claiming fuel-wood is entitled to it or not; and the claims for fuel-wood, with every other claim on the forest, are to be found in the Records of the Proceedings of the last Justice Seat for this forest, begun at Lyndhurst, and adjourned from thence to Winchester, the 29th of September, 1670, before the earl of Oxford, lord chief-justice in Eyre; in which claims are also set forth the small rents payable to the crown by the claimants for pasture and fuel, together with the rates payable annually for the pannage of swine.

For local purposes the New Forest is divided into nine bailiwicks, viz. Burley, Fritham, Godshill, Lynwood, Battramsley, South East, the Nodes, Inn, and North. These bailiwicks are subdivided into fifteen walks, viz. Burley, Holmsley, Bolderwood, Eyeworth, Ashley, Broomy, Rhinefield, Wilverley, Whitley Ridge, Lady Cross, Denny and the Nodes, Ashurst, Ironshill, Castle Malwood, and Bramblehill.

Its officers are a lord-warden, lieutenant, riding-forester, bowbearer, two rangers, woodward, under-woodward, four verderers, high-steward, under-steward, twelve regarders, nine foresters or master-keepers, being one to each bailiwick, and usually fifteen under-foresters or groom-keepers; but at times a smaller number.

The lord-warden is appointed by letters patent under the great seal, during the royal pleasure. This officer has a general superintendence and command over the forest in all matters relative to vert and venison; and appoints the bowbearers, rangers, steward, and all the master-keepers and groom-keepers, to continue during his pleasure, except for the bailiwick of Burley, which has been in grant to the Bolton family for more than a century, by letters patent, renewed from time to time; and the walks of Bolderwood and Ironshill, of which grants were made for the lives of prince William and princess Sophia, the son and daughter of his royal highness the duke of Gloucester, brother of king George III. The lord-warden, by his patent, has the manor of Lyndhurst and hundred of Redbridge, or New Forest hundred, and the office of keeper of the decoy-ponds, with the herbage and pannage, and rents of free tenants. He has also possession of the king's house at Lyndhurst, with an allowance of 70*l*. per annum for repairs. The emoluments arising to the lord-warden amount to 214*l*., and to his steward 48*l*., besides the 70*l*. before mentioned.

The riding-forester (a place which has been abolished, we believe, during the present year) is, or rather was, also an appointment by letters patent, during the royal pleasure. His office was to ride before the king when he went into the forest. The salary 500*l*. per annum, with a fee buck and doe yearly.

The bow-bearers' duty is to attend the sovereign with a bow and arrow when in the forest. Salary 40*s*. per annum, with a fee buck and doe yearly.

The rangers are to drive the deer which stray into the purlieus back again into the forest. Salary 2*l*. 18*s*. 4*d*. per annum; 4*l*. per annum in lieu of wood formerly allowed; and one fee buck and doe yearly to each ranger.

'The woodward is appointed by letters patent from the crown, during pleasure. He has 200*l.* per annum for himself, besides the salary of the deputy. He has also certain perquisites, arising chiefly from the timber, and an assignment of four loads of fuel-wood.

The verderers and regarders are chosen by the freeholders of Hampshire. The verderers have no salary, emolument, or perquisite, besides a fee buck and fee doe yearly. The regarders, who attend the marking of all trees to be felled, value the timber for sale, and attend the sales, are paid by a fee of 2*s.* 6*d.* per day when on actual duty.

The master-keepers' and groom-keepers' duty is to preserve the vert and venison in their respective bailiwicks and walks; to prevent any destruction of either, and all encroachments on the forest. The master-keepers have neither salary nor emoluments except a fee buck and doe each annually; while the under-keepers have small salaries, and, now, limited perquisites.

Another act for the improvement and regulation of this forest was passed in 1800, the enactments of which have not only effected the correction of various minor abuses committed within its limits, but are calculated to make it a permanent benefit to the country, by furnishing an abundant, and not as formerly, a very scanty supply of timber for our navy. The quantity of timber actually delivered for naval purposes, from the year 1761 to 1786, was 23,000 loads of oak and 7003 loads of beech, as appears by the Commissioners' Reports in 1789.

(*Reports of the Commissioners on the Woods, Forests, and Land Revenues of the Crown*, fol., Lond., 1787-1792; Gough's edit. of Camden's *Britannia*, fol., 1804, vol. i., p. 179-187; Ellis's *Introd. to Domesday Book*, vol. i., p. 105-110.)

A Plan of the New Forest, laid down from the surveys taken by Thomas Richardson, William King, and Abraham and William Driver, by order of the Commissioners of the Land Revenue, was published by Faden, in 1789, ten sheets, folio.

NEW GEORGIA ARCHIPELAGO, also called *Solomon's Islands*, constitutes one of the most extensive groups of islands in the Pacific. They extend from north-west to south-east, between 5° and 10° 50′ S. lat., and between 154° 35′ and 162° 25′ E. long. They were discovered by the Spanish seaman Mendana, in 1567; visited for the second time by Carteret, and afterwards by several French and English navigators. Many parts of these islands have not yet been seen by any navigator. The most northern island is Winchelsea or Anson, and the most southern Rennell. The largest islands from north to south are—Bougainville's Island, which is about 60 miles long; Choiseul, which is perhaps as long; S. Isabella, perhaps the largest of the group; Georgia, which extends 40 miles from east to west; Guadalcanar, which is 70 miles long; and San Cristoval, which is about the same size. Besides these there are several islands of less extent, and a great number of small islands. The shores are mostly very steep, and rise to a considerable height. The interior is rugged, and frequently mountainous. Mount Lammor, on the island of Guadalcanar, is compared in elevation with the Peak of Teneriffe. The hills and mountains are generally covered with lofty trees, and the valleys are generally well cultivated and very fertile. Bananas, yams, sugar-cane, and ginger are extensively cultivated. The most common fruit-trees are the bread-fruit, cocoa-palms, cabbage-tree, a kind of almonds, and Indian kale (Caladium esculentum). The clove-tree is also found here. Fowls abound, as well as several wild birds. The inhabitants belong to the Australian negroes, and seem to have made some progress in civilization; but they are cannibals.

(Carteret's *Voyage round the World*, and Krusenstern's *Mémoires*.)

NEW HAMPSHIRE, one of the United States of North America, is situated between 42° 41′ and 45° 11′ N. lat., and between 70° 45′ and 72° 30′ W. long. On the east it is washed by the Atlantic for about 20 miles; the remainder of the eastern boundary-line is contiguous to Maine, and about 150 miles in length. On the north it borders on Lower Canada for about fifty miles. It is separated by the river Connecticut on the west from Vermont, for about 170 miles. The boundary between it and Massachusetts, which lies south of it, is about 80 miles. The length of this state is about 174 miles. Its breadth varies: along 43° N. lat. it is 90 miles wide, but farther north it grows narrower, so that on the parallel of 45° it hardly measures more than 25 miles. Its mean breadth is about 50 miles, and its area is about 8700 square miles. According to some authorities the area is nearly 9500 square miles.

Surface and Soil.—The shores are rather low, and the country along them, to the distance of 20 or 30 miles inland, is in general level; but the land rises imperceptibly, so as to arrest the tides within 20 miles from the sea, though they rise to about 18 feet. This flat tract has a sandy soil of inferior fertility. At the back of it the surface becomes broken and hilly, and the hills gradually rise in elevation as they proceed farther inland, until, at a distance of about 10 miles from the banks of Connecticut river, they constitute a continuous range, running nearly due south and north. Some of the summits attain a considerable elevation. Mount Monadnoc, about 10 miles from the boundary of Massachusetts, rises to the height of 3254 feet, and Mooschillock, farther north, to 4636 feet. On approaching 44° N. lat. the chain expands into an extensive mountain-group, which projects considerably towards the east, and is known by the name of the White Mountains. The highest summit of this group, Mount Washington, is the highest mountain in the United States east of the Rocky Mountains, and attains a height of 6234 feet above the sea-level. Several other summits rise to between 4000 and 6000 feet; as Mount Adams, 5328 feet, Mount Jefferson, 5058 feet, Mount Madison, 4866 feet, Mount Franklin, 4711 feet, and Mount Monroe, 4356 feet. From the northern side of the White Mountains the chain continues on both sides of the Androscoggin river, but it does not attain a great elevation. The country between this northern portion of the chain and the Connecticut river is hilly, rocky, and very thinly settled, on account of the severity of the climate owing to its elevation above the sea, and also an account of the barrenness of the soil. But south of the White Mountains the soil on the declivities of the lower hills and in the valleys between them is good, and that along the banks of the rivers, which is subject to be overflowed annually, is of excellent quality: but in general this state is better calculated for pasturage than for tillage.

Rivers and Lakes.—The Connecticut rises near the northern border of the state, in Lower Canada, in several small branches, but soon begins to form the boundary-line between New Hampshire and Vermont. Though its current is considerably obstructed by falls, rapids, and shoals, the navigation has been so much improved by dams, locks, and short canals, that boats of considerable tonnage may ascend it to Haverhill, near 44° N. lat., a distance of nearly 200 miles from its mouth in a straight line, and even to Fifteen-Mile Falls above Haverhill. [MASSACHUSETTS.] The Merrimack, which rises in the White Mountains and traverses the central districts of the state by a southern course, has also many falls and rapids, but the navigation of this river also has received great improvements, so that it is navigable from its mouth to Concord. The advantages which arise from this circumstance are still increased by the Middlesex Canal. [MASSACHUSETTS.] The Piscataqua, which for about 40 miles forms the boundary between this state and Maine, rises near the southern declivity of the White Mountains in a small lake, and runs south-south-east about 60 miles in a straight line. As a navigable river, it is of small importance, as its course is very rapid, and the tide ascends it only a short distance from the sea; but it forms the fine harbour of Portsmouth.

This state contains several lakes. The largest is Lake Winnepisseogee, which is 25 miles in length, and from one to 10 miles wide. Squam Lake, north-west of the former, is five miles long and four wide. In the northern districts is Umbagog Lake, through which the boundary-line between New Hampshire and Maine passes.

Climate.—The climate of the lower districts may be compared with that of the countries along the eastern shores of the Baltic. Frost occurs sometimes towards the end of September and usually in October, but it is slight. In November the weather is variable, and the frost moderate and not continuous. In December it begins to be intense and lasting. In January a thaw of several days sometimes occurs, but otherwise in this month, as well as in February, the frost is severe. Snow falls to the depth of from two to four feet, and does not disappear before April. In winter the prevailing wind is from the north-west, which rarely blows in summer. From the middle of November to the middle of May the cattle must be kept in stables. The winter does

not last longer in the hilly and mountainous districts, but it is more severe. At Keene, in the south-western part of the state, the thermometer has sunk to 24° below zero, Fahr. In these districts night-frosts are often experienced in June and August, so that July is the only month quite free from frost. This is also the case in the mountainous districts of Sweden, near 60° N. lat. In New Hampshire these districts are probably more than 1000 feet above the sea-level. The heat in summer is great, but we have not found any exact observations on the temperature.

Productions.—The low lands along the rivers yield rich crops of wheat and rye, also flax, hemp, and culinary plants. Barley, oats, peas, and beans are also grown. The uplands produce only moderate crops. Each farmer has an orchard of apple and pear trees, and good cider is made. In most districts Indian corn is grown, but it is sometimes destroyed by the night-frosts in June and August. Horned cattle are abundant, and the dairies very good. The cattle are of a large size. Sheep and pigs are also common; but horses are not numerous, and they are of a small size.

The hills and mountains are still almost entirely covered with extensive forests, consisting of pine, fir, oak, cedar, hemlock, beech, maple, balsam, poplar, birch, hickory, spruce, chesnut, and larch. The most valuable is the white pine, for masts, yards, and planks of vessels. The most common animals in the forests are the black bear, the wolf, fox, wild cats, racoons, and grey, striped, and flying squirrels; but the moose deer, the beaver, and black squirrel have become rare. Several kinds of birds abound; the wild turkey has become rare. The bays and rivers abound with halibut, cod, salmon, shad, eels, and trout. This state is rich in minerals, among which are iron, copper, galena, and plumbago.

Inhabitants.—The natives, who formerly seem to have been numerous and frequently were at war with the settlers, have long since disappeared. The present population consists of the descendants of British who have settled here during the two last centuries. There are a few free coloured people among them. In 1820 the population amounted to 244,155 individuals, among whom were 786 free coloured people. The census of 1830 gave the number at 269,328, or about 30 individuals to each square mile. They are mostly occupied with agriculture, but a considerable number are employed in preparing timber for market. There are manufactures of cotton, broadcloths, and carpets in several towns, particularly Somersworth and Dover.

Political division.—New Hampshire is divided into eight counties. The capital of the state is Concord, situated on the river Merrimack, where it begins to be navigable. It is a small place, which in 1830 contained 3727 inhabitants. Portsmouth is on the æstuary of the Piscataqua, which forms an excellent and spacious harbour, deep enough for vessels of the largest size. Owing to the great rise of the tides, it is rarely impeded by ice, and never freezes over. The town, which is about three miles from the mouth of the river, carries on a considerable commerce, and contains about 8000 inhabitants. Many vessels are built here. The general government has a navy-yard on an island in the harbour. Dover, not far from the Piscataqua, has more than 5000 inhabitants, and some commerce. There are a few other towns with from 2000 to 3000 inhabitants. Dartmouth College, at Hanover, is a respectable institution. The common schools, which are above 1500 in number, are supported by an annual tax.

Commerce.—The foreign commerce of the state is concentrated in the harbour of Portsmouth. From the 1st of October, 1832, to the 30th of September, 1833, the imports amounted to the sum of 167,754 dollars, and the exports to 155,258; of the latter, the goods of foreign produce amounted only to 9903 dollars. Only American vessels were employed in it. The vessels, which entered the port amounted to 10,347 tons, and those which departed to 6002 tons. Formerly the commerce with the West Indies was considerable, but it has much declined since 1812. The state has from 60 to 70 vessels employed in the fisheries.

History.—New Hampshire was first settled in 1623, and the progress of the colony in the beginning was very slow. It had to sustain many distressing wars with the natives who inhabited its present territory. From the middle of the last century its progress was more rapid. In 1775 the provincial convention declared the royal government dissolved, with the view of separating entirely from Great Britain. This took place before the declaration of independence. In 1776 the first provincial congress was established, under the name of a House of Representatives, but the present constitution dates from the year 1792. The legislature, called the *General Court*, is composed of two bodies, the Senate and House of Representatives. The senators, twelve in number, are elected annually by the citizens who pay taxes. The number of representatives depends on the population, and is at present 234. The executive power is vested in the governor, who is annually elected by the citizens of twenty-one years of age. This state sends two members to the Senate and six to the House of Representatives at Washington.

(Darby's *View of the United States*; Warden's *View of the United States of America*; Pitkin's *Statistical View of the Commerce of the United States of America*; *American Almanac for* 1839.)

NEW HANOVER. [NEW IRELAND.]

NEW HEBRIDES is an extensive group of islands in the Pacific, situated, if Banks's Islands are included among them, between 13° 15′ and 20° 5′ S. lat. and between 166° 40′ and 170° E. long. Banks's Islands, the most northern group of the New Hebrides, were discovered by Captain Bligh in 1789; they consist of five small islands and one larger island which is more than 20 miles in circumference. South-west of these islands is the largest of the whole group, Tierra del Espiritu Santo, which was discovered by Quiros in 1605. It extends more than 70 miles from north-north-west to south-south-east, with an average width of 25 miles. It contains a wide bay with good anchorage on its eastern side. Farther south is Mallicolo, which is more than 60 miles long, and about 28 wide, and has a good harbour called Port Sandwich, on the east side near its southern extremity. The islands l'Isle des Lepreux, Aurora, Pentecôte, Ambrym, Paoom, and Apee, which are situated east of Tierra del Espiritu Santo and Mallicolo, are not so large. Farther south is the large island Erromango, which is more than 80 miles in circumference, and the smaller island of Tanna, which is about 20 miles long. Besides these eleven larger islands there is a considerable number of smaller ones, which lie dispersed between and about them. These islands, or at least some of them, are of volcanic origin. An active volcano exists on the island of Tanna. These islands consist mostly of hills of moderate elevation, which however in some of them rise to the height of mountains. The valleys between these hills and also the level tracts along the coasts are very fertile. The uncultivated declivities of the hills are covered with trees. These islands are very rich in vegetable productions. It is said that more than forty different kinds of plants and trees are cultivated. The banana, sugar-cane, yam, arum, batata, and curcuma are grown in regularly divided fields, and with great care. The cocoa-nut, bread-fruit, the cabbage-tree, a kind of figs, almonds, and oranges are common. Bamboos, pepper, and mastic are abundant, and the nutmeg-tree occurs likewise. The domestic animals are hogs, pigs, and fowls. The inhabitants eat their enemies who fall in battle. They belong to the race of the Australian negroes, but have made greater advances in civilization than most of the other tribes of that race, as the state of their agriculture evinces. It seems that they do not speak one language, it being said that on the island of Tanna three different languages are used. This island is the best known, since Cook remained there some time, when he discovered most of these islands in 1774. (Cook's *Voyages*; and Krusenstern's *Mémoires*.)

NEW HOLLAND. [AUSTRALIA.]

NEW IRELAND is an island in the Pacific, situated between 2° 40′ and 4° 52′ S. lat. and 150° 30′ and 152° 50′ E. long. It is more than 170 miles long from south-east to north-west, but on an average not much more than 12 miles wide. It was considered as a part of New Guinea by its discoverers Schouten and Le Maire; and after Dampier, in 1700, had discovered Dampier's Strait, which separates New Britain from New Guinea, it was thought to be a portion of New Britain, until, in 1767, Carteret discovered the strait which separates both islands. Dampier had taken it for a bay, and called it St. George's Bay, a name which Carteret changed into St. George's Channel. The strait which divides it from New Hanover was called by Carteret, Byron's Strait. Near the southern extremity, Cape St. George, there is a good harbour, called Port Praslin. The island has a hilly surface, and some summits rise into mountains, but all of them

are covered with wood. The lower tracts are well cultivated, and produce bananas, sugar-cane, batatas, ginger, yams, bread-fruit, cocoa-nuts, sago, figs, bamboos, and many other plants and trees. Dogs, pigs, and turtles are abundant. The inhabitants belong to the Australian negroes, and resemble in every respect their neighbours the inhabitants of New Britain. New Hanover is situated farther west, and is about 30 miles long from east to west; it is likewise very hilly, and even mountainous, but contains many cultivated tracts. (Carteret's *Voyage round the World;* and Krusenstern's *Mémoires.*)

NEW LONDON. [CONNECTICUT.]

NEW MEXICO. [MEXICAN STATES.]

NEW RIVER. [MIDDLETON, SIR HUGH.]

NEW SIBERIA. [SIBERIA.]

NEW SOUTH SHETLAND is a group of islands situated south-south-east of and about 600 miles from Cape Horn, between 61° and 63° 30′ S. lat. and 53° and 63° W. long. They extend from east-north-east to south-south-west, over a space of nearly 300 miles, and consist of twelve islands of moderate extent, and a great number of rocks and cliffs. They were discovered in 1819 by Captain Smith, and have frequently been visited since that time for the purpose of taking fur-seals and sea-elephants, with which the shores abound. The largest of the islands from east to west are Clarence, Elephant, King George, Strachan, Mitchell, Sartorius, Livingston, Low, and Smith. The interior of these islands consists of high hills or mountains. A mountain on Smith's Island attains the height of 6600 feet above the sea. They are almost entirely covered with snow all the year round, and only after Midsummer (in January) a few tracts, which are free from snow, are overgrown with lichens and mosses, in some places intercepted with a sort of straggling grass. The only inhabitants of these cold regions are numerous sea-fowls, as the albatross, penguin, &c., and the animals above mentioned. The surrounding sea abounds in whales and fish. Most, if not all, of these islands are of volcanic origin. Captain Weddel observed smoke issuing from the rocks of Bridgman Island, and the Island of Deception has the form of a horse-shoe, resembling in that respect the islands of the Pacific, which are formed by madrepores. The deep depression in the middle of Deception Island, which is 97 fathoms deep and makes an excellent harbour (Port Foster), is doubtless a crater, and this island may, as to form, be compared with the island of Nisita in the Bay of Naples. The high rocks which enclose this crater are volcanic, rise to more than 800 feet above the sea, and are partly covered with ice. South of these islands is a wide strait, called Bransfield Strait: the coasts which constitute the southern shores of this strait appear to form an extensive country, which has lately attracted the attention of navigators. [SOUTH POLAR COUNTRIES.] (Weddel's *Voyage* and Foster's *Voyage.*)

NEW TESTAMENT. [GRIESBACH; TESTAMENT.]

NEW-YEAR'S-DAY. Of the customs formerly practised at the opening of the new-year, none appear to have been so universal as feasting and sending presents, both of which the moderns appear to have derived from the Romans. Suetonius (*August.*, § 57, edit. varior., 8vo., 1647, p. 198) alludes to the practice among the Romans of bringing presents to the Capitol on new-year's-day, whether the emperor was present or absent; and Tacitus speaks of an order of Tiberius, forbidding the giving or demanding of new-year's-gifts unless it were on the calends of January. The early Fathers of the church condemned this practice as superstitious, because the gifts were considered as omens of success for the ensuing year.

New-year's-day with us, like many others, in modern times, has lost much of the ceremonials of its observance. In a volume of 'Miscellanies,' printed in Queen Anne's time, we read,—'January. On the first day of this month will be given many more gifts than will be kindly received or gratefully rewarded. Children, to their inexpressible joy, will be drest up in their best bibs and aprons, and may be seen handed along streets, some bearing Kentish pippins, others oranges stuck with cloves, in order to gain a blessing of their godfathers and godmothers.'

Gifts at new-year's-tide formed a charge of no small amount in the privy-purse expenses of royalty, from very early times to the time of Charles II.: they were mostly made in plate.

Moresin, who published his 'Papatus' in the time of James I., tells that in Scotland it was then the custom to *send* new-year's-gifts on new-year's-eve; and on new-year's-day they wished each other a happy day, and *asked* a new-year's-gift. When Brand wrote his 'Popular Antiquities,' it was still usual in Northumberland for persons to ask for a new-year's-gift on that day.

The modern Jews, on the first day of the month Tisri, which may be considered as their new-year's-day, usually have a splendid entertainment, and wish each other a happy new-year.

Hospinian says, that at Rome on new-year's-day (he speaks of modern practices) no one would suffer a neighbour to take fire out of his house, or anything of iron, or lend anything. (Brand's *Popular Antiq.*, vol. i., p. 8-18, &c.)

NEW YORK is one of the largest and the most important of the states which compose the North American Union. It is situated between 40° 40′ and 45° N. lat., and between 73° and 80° W. long. It extends in length from south to north more than 300 miles, and in width, along the parallel of 42° N. lat., 340 miles. Its surface is estimated at more than 46,000 square miles, or about 4000 miles less than that of England without Wales. To the north and west of New York lie the Canadas, from which it is separated by the parallel of 45°, called the Canadian Line, and by the river St. Lawrence, Lake Ontario, Niagara river, and Lake Erie. On the south it is bounded by the states of Pennsylvania and New Jersey, and the Atlantic Ocean; the Delaware river forms the boundary-line between it and Pennsylvania for 65 miles. On the east it borders on Connecticut, Massachusetts, and Vermont. Lake Champlain constitutes the boundary-line for 105 miles between New York and Vermont.

Surface and Soil.—None of the United States presents a greater variety of surface than New York, a circumstance owing to its including portions of two large mountain-systems, the Appalachian and Acadian Mountains, and to its containing also a mountain-system of its own, the Essex Mountains. These three mountain-systems are divided from one another by wide valleys, mostly of a peculiar description and from the lakes Erie and Ontario by a plain of considerable extent.

The Appalachian Mountains in Virginia, in 39° N. lat., occupy, with their numerous parallel ridges, hardly more than 100 miles in width. But near 40° N. lat. they begin to widen, and at 41° N. lat. they are above 200 miles in width. This extension is produced by the eastern and central ridges turning to the east and east-north-east, whilst the western ridges (the Laurel Hills and Chesnut Ridge) continue in the general direction of the system north-north-east. These western ridges grow lower and less distinct as they approach 42° N. lat., and north of that parallel they are lost in an elevated plain or table-land, which has a hilly surface. The eastern ridges continue as distinct mountain-masses eastward to 74° 40′, or a distance of from twenty-five to thirty miles from the banks of the river Hudson, where they may be said to terminate; but their extremities are here united by a mountain-ridge whose general direction is north and south. This ridge forms a continuous range between 41° and 42° N. lat. Its southern extremity, which lies within the state of New Jersey, is known by the name of the Kittatinny Mountains, but the whole has not yet been designated by a name. We should propose the appellation of Tuscarora Mountains, to perpetuate the name of that tribe of the Six Nations, to whose memory no geographical monument exists. This Tuscarora range continues beyond the union of the ranges northward to 43° N. lat., where it turns westward, and after extending in that direction nearly fifty miles, terminates at the eastern extremity of the table-land on which the western ranges of the Appalachian Mountains are lost. But all the eastern chains of the Appalachian Mountains do not unite with the Tuscarora Mountains. The most southern, known in New Jersey under the name of the Blue Ridge, is divided from them by the valley in which the Pawling and Wallkill rivers flow south-west and north-east. This last-mentioned ridge continues in a north-eastern direction to the very banks of the Hudson river, where it terminates with the Mattewan Mountains or Highlands, between West Point and Newburg.

Opposite the Highlands and east of the Hudson river rise the Fishkill hills, which constitute the south-western extremity of that extensive mountain-region which occupies a considerable portion of New England, and extends through Lower Canada to the very mouth of the St. Lawrence river.

Though commonly considered as a portion of the Appalachian Mountains, it claims a distinct consideration, and ought to be designated by a particular name, for which we propose that of Acadian Mountains, as the greatest part of this mountain-region was formerly known by the name of Acadia. The Fishkill hills run from the banks of the Hudson north-east and north through New York, until they arrive at its eastern boundary-line, where the states of Connecticut and Massachusetts meet, and where they take the name of Taghkanic range. From this point, continuing to the east of north, they constitute the boundary between Massachusetts and New York, until, by declining more to the east, they enter the first-named state, and proceed into Vermont, where they are called the Green Mountains. Between them and the Tuscarora range extends the valley of the middle Hudson.

The Essex Mountains are situated entirely within the limits of New York, and have only lately and partially been explored. They occupy the country between 43° 20′ and 44° 30′ N. lat., enclose Lake George, extend along the western shores of Lake Champlain, and reach westward probably to 74° 30′ W. long., so that they extend about fifty miles in width. West of them is an elevated table-land, which seems to run to 75° 40′ W. long., and which on the south terminates in the valley of the Mohawk river, which valley separates it from the Tuscarora range, where this range runs east and west.

New York contains seven regions, different in configuration of surface and in fertility, and to a considerable degree also in climate—the hilly region of the Susquehanna and Delaware rivers, the elevated table-land, the declivity of the table-land towards Lake Ontario, the northern region, the valley of the Mohawk river, the valley of Lake Champlain, and the vale of the Hudson river, to which the island of Long Island and Staten Island are to be added.

The region of the Susquehanna and Delaware rivers comprises the country which is surrounded on the east and north by the Tuscarora range, and is drained by the upper branches of the Delaware and those of the eastern branch of the Susquehanna; it extends westward to about 76° W. long. The mountain range which surrounds it probably in no part exceeds in absolute elevation 2000 feet. The valleys which descend from the Tuscarora range, chiefly in a south-western direction, contain rather wide and extensive bottoms of great fertility, which in their natural state are overgrown with forests of sugar-maple, black walnut, elm, beech, and other trees, indicating a strong soil. The declivities of the mountains are rather steep, and their soil of inferior quality; they are mostly overgrown with pine, among which oak, chesnut, and hemlock are intermixed. The valleys, when cultivated, yield rich crops, and hence this region is comparatively well settled.

West of this region, along the boundary-line of Pennsylvania, lies the elevated table-land on which the western ridges of the Appalachian Mountains terminate, and the western branch of the Susquehanna, the Alleghany river, an affluent of the Ohio, and the Genessee river originate. It is from 20 to 30 miles wide, terminating on the north at the southern extremity of the lakes Cayuga and Seneca. Its surface is broken and hilly, but the hills are scattered over the country, and not disposed in ridges. Towards the western extremity, two short ranges, the Cattaraugus and Chatauque hills, rise to a considerable elevation. At the eastern extremity the table-land seems not to exceed 1000 feet in elevation, but at the sources of the Genessee and Alleghany it probably rises to 1300 feet, or more than 800 feet above Lake Erie. The deepest depression seems to occur between Lake Seneca and the village of Elmira on the Tioga, an affluent of the western branch of the Susquehanna, and in this direction the summit level does not exceed 885 feet, but it lies in a valley. The country is almost entirely covered with wood, mostly pine, and is at present very thinly settled. Some sheltered tracts between the hills exhibit a considerable degree of fertility.

From this table-land the country slopes towards Lake Ontario; but it can hardly be called a slope, as there is a rise, though not a considerable one, towards the shores of the lake. Between the table-land and this rise there is a slight depression extending in the form of a trough east and west: it is called the Lake Country. At the eastern extremity of this depression, between Lake Erie and the river Genessee, the country seems gradually to descend from 1000 feet and upwards to 565 feet, which is the Erie level of the Grand Canal. Where the country descends from the table-land, there are numerous lakes, of which the most considerable are Canandaigua (685 feet), Crooked Lake (700 feet), Seneca (440 feet), and Cayuga (400 feet). These numbers, indicating the elevation of the lakes above the sea, show that the depression lowers in its course from west to east. The surface of this depression is generally either level or undulating, and rarely hilly, but the lakes lie deep under the general surface in wide chasms, and the beds of the rivers are likewise much depressed. In its natural state this country is covered with high forest trees, and, when cultivated, yields most abundant crops. It is the most fertile portion of the state, and as it is contiguous to the Grand Canal, cultivation is extending rapidly, and the population has, in the last twenty years, probably doubled twice. The central portion of the canal passes through the depression, but the western part passes over the higher grounds which separate it from Lake Ontario.

The higher ground, which occurs north of this region, and about ten or twelve miles from the shores of Lake Ontario, does not appear to be much more elevated than the Lake Country. Its surface is uneven and broken, and the soil partly stoney and gravelly, and in general of indifferent quality. From this higher ground the country descends uniformly and gradually to Lake Ontario, except that, between Niagara and Genessee rivers, a distance of 80 miles, it is traversed in its whole length by what is called the Ridge Road or Alluvial Way. This elevated tract is composed of common beach sand and gravel stones, apparently worn smooth by the action of water, and the whole is intermixed with small shells. Its general altitude above the neighbouring land is 30 feet, and its width varies considerably. At the Niagara and Genessee rivers it is found to be about 120 or 130 feet above their level, and thus it appears that it is about 150 feet above Lake Ontario, from which it is 6 or 10 miles distant. It is conjectured that it once constituted the shores of that lake, which by some change in its outlet has sunk about 150 feet below its antient level. As the country on both sides of this extraordinary ridge is thickly wooded, but the ridge itself without vegetation, the first settlers chose it as the line of road, whence it derives its name. We find no mention of a similar elevation east of the river Genessee. The country traversed by the Alluvial Way seems to be of indifferent quality.

The northern region comprehends the country lying north of Lake Oneida and of the valley in which the Mohawk river flows, as far east as the mouth of the East Canada creek. Farther east its southern boundary is formed by a line drawn from the last-mentioned place to Glens Falls on the Hudson river, which occur where the river flows from west to east. It is separated from Lake Champlain by the deep depression in which that lake lies. Northward it extends to the Canadian line, the St. Lawrence, and westward to Lake Ontario. It comprehends the Essex Mountains, as well as an elevated and extensive table-land lying to the west of the mountains, and the declivities with which the mountains and table-land descend to the south, west, and north. It comprehends about one-third of the surface of the state, and a great portion of it, perhaps one-half, is uninhabited. The mountains occupy the eastern part of the region: they begin on the south, between Glens Falls on the Hudson river and the southern extremity of Lake George. A lower ridge separates that lake from Lake Champlain, but the more elevated portion of the mountains extends along the western shores of Lake George northward. In its southern parts this range does not appear to rise to a great elevation; but north of 44° N. lat., and especially between 44° 5′ and 44° 10′, some of its summits rise above the line of trees. The most elevated, called the High Peak of Essex, or Giants' Mountain, attains an elevation of 5467 feet, or above 1800 feet more than Mount Catskill, the most elevated summit of the Appalachian Mountains whose height has been determined, and only about 800 feet less than Mount Washington, the highest summit of the White Mountains in New Hampshire. Mount MacIntyre, west-north-west of the Giant Mountain, attains 5183 feet, and several other peaks rise to between 4000 and 5000 feet. The snow does not disappear from the summit of the Giants' Mountain till after the middle of July. The valleys embosomed between these higher ranges are from 2000 to 3800 feet above the sea-level, and of course uninhabited and uninhabitable. In the Alps, valleys of such an elevation are only inhabited during some weeks in the summer. The valleys are however covered with pine, spruce, and birch trees,

Towards the summit of the mountains, these trees become dwarfish, and are interwoven with each other by their numerous horizontal branches. On the highest summits however the trees disappear entirely, and are replaced by mosses, lichens, and small alpine plants.

The climate of this elevated region is so cold, that ice is formed during the night in the beginning of August. Towards the south the valleys are much lower, and a few settlements have been made. It is not exactly known how far the mountains extend westward, but probably they reach to 74° 30′ W. long., enclosing the numerous upper branches of the Hudson river. West of this mountain-region lies a table-land of an uneven surface: as no settlements have been formed here, it is little known, except that it does not contain ridges of high mountains, that a portion of it is covered with swamps, and a still greater part intersected with lakes. As the numerous rivers which originate on it descend by a succession of rapids and cataracts, its elevation above the sea must be considerable and the climate extremely severe, a circumstance which will account for the entire want of settlements east of 75° 30′, and northward only at a distance of from 20 to 25 miles from the banks of the river St. Lawrence. On the south this elevated region is bounded by a range of hills, which constitutes the northern border of the valley of the river Mohawk, and separates it from the upper course of Black River, of Lake Ontario, and of the Sacondago river. It extends between 74° 15′ and 75° 30′ W. long., from east by north to west by south, and is called the Sacondago Hills. According to a vague estimate of Darby, these hills rise from 1200 to 1500 feet above the sea-level, but they are probably higher. The declivity of this elevated region seems to begin on the west about 20 or 30 miles from the shores of Lake Ontario and the St. Lawrence river, where the settlements commence. In the valley of Black River they extend to a greater distance, probably because the bottoms of this river are more sheltered and more extensive than those of the other rivers. These settlements however occur at great distances and only on the banks of the rivers, the remainder of the region being entirely covered with woods. The climate of these declivities is very severe, as they are exposed to the prevailing cold winds which blow from the north-west.

This region is divided from the Tuscarora range by the valley of the river Mohawk. This valley may be said to begin at Rome, to which place this rapid river runs in a ravine from north to south. From Rome the river flows south of east, and the valley along its banks may be said to extend about 60 miles to Amsterdam, where it opens upon the vale of the Hudson river. The valley is in general from three to six miles wide; but at 75° W. long. it is traversed by a ridge of rocks which connect the Tuscarora Mountains with the Sacondago Hills, and running across the river cause it to form some cataracts, which are called the Little Falls. The bed of the river above the falls is more than 400 feet higher than the sea, but below the falls it is 40 feet less. The country which separates the Mohawk from Lake Oneida does not attain a height of more than 431 feet above the sea. That portion of the valley which lies above the falls is very fertile, and in this respect resembles the Lake Country. The Herkimer and German Flats, which are contiguous to the rocks forming the falls, are an alluvial tract noted for fertility. The lands below the falls are more hilly and less fertile, but still fertile enough to repay the labour bestowed on their cultivation. The whole valley is well settled, and the Grand Canal traverses it in its length.

Lake Champlain lies along the foot of the Essex Mountains on their eastern side, and on the east of the lake are the Green Mountains of Vermont, but they are at a much greater distance from the lake. The higher parts of both ranges are from 25 to 30 miles apart. Two-thirds of this space belong to Vermont, and the remainder is occupied by the lake and a very hilly country which lies between it and the Essex Mountains. The valleys and flats between the hills and on the borders of the lake are not distinguished by fertility, but give good crops when cultivated with care. From the southern extremity of Lake Champlain a glen extends between the hills which cover the country to the Hudson river below Glens Falls. The highest level of this glen is only 140 feet above the tide-water in the Hudson river, and 50 feet above the level of Lake Champlain. Through this glen the Champlain Canal has been made, which unites the river to the lake. As the outlet of the lake, the river Chambly, falls into the St. Lawrence river, a water communication has thus been opened between the St. Lawrence and the Hudson.

The vale of the Middle Hudson begins near 43° 20′ N. lat., where the river, after issuing from the Essex Mountains, forms Glens Falls, and begins its southern course. It extends, with a width of from 60 to 80 miles, between the Taghkanic Range on the east and the Tuscarora range on the west to the Fishkill Hills and the Mattewan Mountains, a distance of nearly 150 miles. The mountain-ranges which enclose it do not appear in any part to rise to much more than 2000 feet above the sea-level. The slope on the east of the river is rapid but regular. The surface frequently rises into hills, but they do not attain a great elevation, and their declivities generally admit cultivation. The soil possesses a considerable degree of fertility, and to this circumstance, united to the advantages offered by a river navigable for large vessels, must be ascribed the fact that this portion of New York is one of the most populous and best cultivated. That portion of the vale which lies west of the river presents a greater variety in surface and fertility. At two places it is traversed by offsets from the Tuscarora range. North of 42° N. lat. are the Catskill Mountains, three ranges which lie east and west, and extend from 10 to 25 miles from the Tuscarora Mountains eastward. The most northern and shortest rises, in the Roundtop, to 3804 feet, and the southern and longest, which properly is called Mount Catskill, to 3486 feet. These summits are the most elevated in the Appalachian Mountains, with the exception perhaps of the Peak of Otter in Virginia, whose elevation is estimated at 4000 feet. Farther south, near 41° 20′ N. lat., another ridge branches off from the southern extremity of the Tuscarora Mountains, and advances to within 10 miles from the river in a north-eastern direction. It is properly the prolongation of the Kitatinny Mountains of New Jersey, but in New York bears the name of the Shawangunk Range. It probably does not attain the height of 2000 feet. On the western, as on the eastern side of the Hudson, only a few alluvial tracts occur on the banks of the river, and they are of very small extent. The country generally rises from the west banks with a rather rapid ascent to 200 feet and more, and then extends in a broken and hilly surface to the base of the mountains, though flat tracts occur in some places. The soil is in many places stoney, but it generally possesses a considerable degree of fertility, though it is some what inferior to that on the east side of the river. At the most south-western extremity of this region, between the Shawangunk Range and the Mattewan Mountains, in the valley of the river Wallkill, is a tract of exuberant fertility, called the Drowned Lands. Its southern extremity lies within the county of Sussex in New Jersey, but the greater portion is in Orange County in New York. It is from 35 to 40 miles in length and from 5 to 7 wide, and seems to have been a lake. It is flat and marshy, and some small lakes are scattered over it. In spring it is subject to inundation.

The vale of the Lower Hudson extends from the Mattewan Mountains and Fishkill Hills to the very mouth of the river, a distance of about 60 miles. The Fishkill Hills rise to a considerable elevation, Beacon Hill attaining 1471 feet, and New Beacon, or Grand Sachen, 1685 feet above the sea-level. The Mattewan Mountains west of the river, though high, do not attain so great an elev[illegible]. Both ridges terminate on the banks of the river in [illegible] rocks, which extend on each side for about 20 miles. The prevailing character of the surface and soil of this region is rocky, especially on the west of the river. The Mattewan Mountains terminate on the banks of the river with very high and precipitous rocks, which from Newburg extend to West Point, and even south of the last place. The higher lands recede to a distance from the river, and slope to the banks with a rather gentle declivity. This gentle slope continues along Tappan Bay; but from Tappan to a distance of about 8 miles from the town of New York, the Palisadoes, as they are called, extend along the river: they consist of enormous masses of rocks, from 20 to 500 feet in height. In some places they rise almost perpendicularly from the shore, forming for many miles a solid wall of rock, diversified only by an occasional fishing-hut on the beach at their base, and sometimes by an interval of a few acres of arable land, affording an opening for a landing-place, and a steep road leading to

their top. The highest part of the rocks lies contiguous to the river, from which they descend towards the interior of the country. The whole tract south of the Mattewan Mountains has a very rocky soil, and the cultivable land is only a small portion of it. The country east of the river also rises with a bold and broken shore, but it is less high and precipitous, and the surface of the country farther back is varied by ascents and descents. It contains a much larger portion of cultivated land, but the soil is rocky and of inferior quality, so that the country is rather thinly settled, notwithstanding the neighbourhood of the populous city of New York.

Long Island is about 115 miles long from west to east, and on an average between 9 and 10 miles wide: in some places it is 20 miles across. At the eastern extremity a shallow inlet, called Peconic Bay and Gardner's Bay, separates it into two peninsulas, of which the southern extends farthest east, and terminates with Montauk Point. A ridge of low hills extends along the northern shores of the island, and from their base to the southern shores there is an alluvial margin from one to five or six miles wide. Along the southern shores, and from one to two miles from it, extend long, narrow, low, and sandy islands. The intermediate space between these islands and the shores is occupied by shallow sounds. The soil is everywhere sandy and light, but within the hilly tract, especially at the western extremity, and from 20 to 30 miles eastward, it is of considerable fertility. The largest portion of the eastern districts is still covered with pine. The level tract along the southern shores is generally sterile and in some parts not worth cultivation. The area of Long Island is about 1200 square miles.

Staten Island is separated from Long Island by the strait called the Narrows, which forms the entrance into New York Bay. Staten Island is about 14 miles long and 8 wide, with an area of 77 square miles.

Rivers, Lakes, and Long Island Sound.—On the elevated table-land which extends along the northern boundary of Pennsylvania all the large rivers rise which fall into the Atlantic west of the mouth of the Hudson and east of the innermost recess of Chesapeake Bay. This region contains the sources of the Delaware [DELAWARE] and Susquehanna [PENNSYLVANIA], and also those of the Alleghany, one of the principal branches of the Ohio. On the same table-land, and probably in the most elevated portion of it, between the upper branches of the Alleghany and Susquehanna, and within the limits of Pennsylvania, rises the Genessee, which runs in a general northern direction about 125 miles, measured along its course. In its middle course, which lies in the Lake Country, it traverses a deep and wide valley of great fertility, and forms at Rochester, 5 miles from its mouth, a cataract 95 feet high. But above this impediment the river is navigable about 70 miles for boats.

Not far from the eastern banks of the Genessee river commences that remarkable series of lakes, which extend nearly 100 miles farther eastward, and are from 20 to 30 miles distant from Lake Ontario. These lakes extend in length from south to north, or rather, lines drawn from their most northern extremity, in the direction of their length, to Lake Ontario, cut the shores of that lake at right angles. The most considerable of these lakes, from west to east, are, Lake Canandaigua, which is 14 miles long, and from one to two wide; Crooked Lake is 18 miles long, and about 1½ miles wide; Seneca Lake is 35 miles long and from 2 to 4 miles wide; Cayuga Lake is 38 miles long and from 1 to 4 miles wide; Skeneatiles Lake is 15 miles [illegible] and from ½ to 1½ mile wide; and Oneida Lake, the most [illegible] is 20 miles and 4 miles wide. Onondaga Lake, which [illegible] between Skeneatiles and Oneida lakes, is 6 miles long and two wide, and remarkable for the copious and strong salt springs, which occur at a distance of a mile from its eastern banks. All these lakes, except the most western, that of Canandaigua, discharge their water by one river, the Seneca. This river issues from the northern extremity of Lake Seneca, which receives the waters of Crooked Lake by a narrow channel, and winds with numerous bends through the Lake Country, running in a general north-eastern direction. Each lake discharges its waters by a separate channel into its bed. In approaching the western extremity of Oneida Lake it is met by the channel issuing from that lake, and after their union the river is called Oneida or Onondaga River.

Black River rises on the western declivities of the Essex mountains, and descends from the table-land of the northern region first by a south-western and afterwards by a north-western course. About 36 miles from its mouth it turns west, and discharges its waters into Sackets Harbour, a small bay on Lake Ontario. This river runs about 120 miles, but in many parts of its course it consists of a series of cataracts and rapids. The lower falls, which are 7 or 8 feet in perpendicular height, occur at Brownville, eight miles, measured along the channel, above Sachets Harbour.

The table-land west of the Essex Mountains contains many lakes, and some of considerable extent, but our information respecting this region is still very scanty. The most eastern ridges of the Essex Mountains contain Lake George, which extends from south-south-west to north-north-east 33 miles, with a width varying between 1 and 7 miles. It is enclosed on all sides by high rocks, and contains many small rocky islands. It is 200 feet above Lake Champlain, into which it discharges its water by a channel at Ticonderoga. Lake Champlain extends northward into Lower Canada. [CHAMPLAIN.]

The largest river of New York, and perhaps the most important river of the United States, next to the Mississippi, is the Hudson. It is formed by two branches. The eastern branch rises, according to the most recent information, between 44° 5′ and 44° 10′ N. lat., on the northern declivity of Giants' Mountain, 4747 feet above the sea-level, and enters by a western course a wide valley which is 3711 feet above the sea. After some windings in the mountain-valleys, it takes a regular course to the west of south, until it turns a little to the west and meets the western branch. The western branch rises in the western ridges of the Essex Mountains, and runs south and east of south until it meets the eastern branch near 43° 30′ N. lat. As both branches descend from a very elevated region, their current is very rapid, and frequently interrupted by rapids and cataracts. The united river runs southward for some distance, and where it begins to turn to the east, it is precipitated over a ledge of rocks, and forms the Great Falls. Twenty miles lower down are Glens Falls, where the river turns again to the south, which direction it maintains with slight deviations to its mouth. Below Glens Falls the river becomes navigable, though the current continues to be rapid to the mouth of the Mohawk river. The tide ascends the river as far as the mouth of the Mohawk, and below this point the river is wide, but still its mean breadth does not amount to a mile. In some places it widens considerably and appears like a lake, as above Newburg, and still more above Tappan. The latter enlargement, called Tappan Bay, is from two to five miles wide, and continues for eight miles. About 30 miles from its mouth, which is between Sandy Hook in New Jersey and the western extremity of Long Island, the river divides into two arms, which enclose the island of Manhattan. The eastern and more narrow arm is called Haerlem River, and after it has united to Long Island Sound, East River. Where the river meets Long Island Sound is a dangerous strait in which it forms whirlpools and eddies; this pass is called Hell-gate, or Hurlgate. At the city of New York the East River unites again with the West River or proper Hudson, and the spacious bay of New York is formed. But before the river enters the sea, it sends off another arm to the westward, which surrounds Staten Island, under the names of Newark Bay, the Kills, and Amboy Bay. The Hudson is navigable for ships to Albany, 120 miles from its mouth, and to Troy, 36 miles farther up for sloops. It may be ascended by boats to Glens Falls, but this navigation is now superseded by the Champlain Canal, which extends along its western banks. The whole course of the river probably exceeds 350 miles. After issuing from the mountain-region the Hudson is not joined by any considerable tributary, except the Mohawk river, which rises on the table-land west of the Essex range, near 75° 30′ W. long., and runs southward. About 14 miles north of Utica it forms the Trenton Falls, by which the river descends 387 feet in a space of less than 5 miles. Some miles below these falls the Mohawk turns to the south-east. Below the village of Herkimer are the Little Falls, by which the river descends more than 30 feet in the distance of a mile. A mile above its mouth are the Cohoes Falls, 40 feet in perpendicular height. The tide ascends to the last-mentioned falls. At Waterford the Mohawk joins the Hudson, after a course of about 120 miles.

Long Island Sound, or the strait which divides Long Island from the continent, is about 120 miles long, with a

varying width. The eastern portion, extending as far west as Stamford in Connecticut, and Lloyd's Neck on the island, has an elliptical form, widening from about 8 miles at each extremity to about 20 miles in the middle. West of Lloyd's Neck it gradually contracts, and at its western extremity varies between half a mile and 2 miles for a distance of eight miles, until it joins East river. In the western and more narrow portion of the strait, the channel is rocky and much interrupted by small islands and projecting points. But the strait has, in general, depth sufficient for the largest vessels.

Climate.—The mean annual temperature of the city of New York is between 52° and 53°, which is only 2° or 3° higher than that of London, though it is more than 10° nearer to the equator. But this city has a milder climate than any other part of the state except Long Island. The vale of the Hudson river is much colder than any part of Great Britain. In December the cold increases gradually, and the winter lasts to the end of March. In January and February the thermometer sometimes sinks to 2° Fahr. Snow lies on the ground several feet deep, and the river is passed on the ice. The ice usually does not break up before the end of March. The spring months are raw, chilly, and damp. In summer the thermometer ranges, in general, between 60° and 80°: it sometimes rises to 85° and for a few days to 90°, but rarely higher. In September the weather is fine, but there are a few severe storms about the equinox. In October and November the weather is dry and clear, but some night-frosts occur, and towards the end of the latter month snow begins to fall. But the temperature is subject to great and sudden variations, even in the same day. These variations sometimes amount to 20° and even 30° of Fahrenheit. Such is in general the climate of the vale; but the cold is much more severe towards its northern portion in the vicinity of the mouth of the Mohawk river, which is ascribed to the prevalence of the north-western winds, which blow with considerable force through the valley of the Mohawk. The same winds render the climate of the valley of the last-mentioned river colder than the countries farther east or west. The Lake Country, on the contrary, enjoys a milder climate, its temperature being generally at least three degrees higher than that of the valley of the Mohawk. But it is subject to dense fogs, and is considered the most unhealthy portion of the state. In summer south-western winds prevail in this country. The northern region has very severe winters, so that during six months the country is covered with snow and the rivers frozen. In the high valleys of the Essex Mountains it freezes even in August.

Productions.—The cultivated cerealia are maize, wheat, rye, barley, oats, and buck-wheat. Artificial grasses are cultivated in some parts, especially in the neighbourhood of New York. Potatoes and turnips are generally cultivated. Immense quantities of melons are raised. Peas and beans succeed very well. Apples, peaches, and cherries are plentiful, but pears and plums are not so abundant. Currants and strawberries are cultivated near New York. In some parts flax and hemp are grown, especially in the Lake Country. All the domestic animals of England are reared in New York with success.

A considerable part of the state is still covered with forests, which consist of oak of different species, ash, walnut, pine, maple, beech, chesnut, birch, poplar, elm, cedar, hemlock, and hickory. The most extensive forests occur in the northern region.

The panther is rare, except in the Essex Mountains, which also contain the moose-deer. Deer are still frequent in the western districts and northern region. Other wild animals are, wolves, bears, grey and red foxes, racoons, skunks, minks, beavers, otters, squirrels, and hares. The musk-rat and marten have nearly disappeared. The wild turkey has become rare, even in the western districts, but swans, wild geese, ducks, and pigeons are abundant. The sea and the lakes abound in fish.

Several minerals occur in abundance, but only iron, salt, limestone, and marble are worked. Coal does not exist, at least not in such quantity as to be worked; and it is imported from various places, especially from Nova Scotia.

Political Divisions and Towns.—The state of New York is divided into fifty-six counties, having an aggregate area of about 46,085 square miles.

There are nine incorporated cities, viz., New York, Albany, Troy, Hudson, Schenectady, Utica, Buffalo, Rochester, and Brooklyn. Their relative importance may be inferred from the amount of their population severally at the last census, viz.:—

New York	202,589	Buffalo	8,653
Albany	24,209	Utica	8,323
Brooklyn	15,396	Hudson	5,392
Troy	11,605	Schenectady	4,258
Rochester	10,885		

There are also 124 incorporated villages,* many of which contain from 3000 to 5000 inhabitants.

Brooklyn, on the East River, on Long Island, is opposite to New York, and may be considered as a suburb of that city. The two places are three-quarters of a mile distant, and communication is kept up between them by steam and horse-ferry boats. The population of Brooklyn is now 15,396. [BROOKLYN.]

There are many flourishing towns and villages on both sides of the Hudson river. Newburg, on the west side of the river, is 61 miles north of New York, and has a population of 6424. Poughkeepsie, on the east side of the Hudson, 74 miles from New York, has a population of 7222. Catskill, on the west side of the river, and near the Catskill Mountains, about 108 miles from New York, has a population of 4860. Hudson, on the east side of the Hudson, nearly opposite to Catskill, is a large manufacturing town, and has about twelve ships engaged in the whale fishery: the population is 5392. Albany, on the west side of the Hudson, and the seat of government, is the second city in the state. Next to James-town in Virginia, it is the oldest settlement in the United States. Since the completion of the Erie and Champlain canals, its growth has been very rapid. [ALBANY.] Six miles above Albany, on the opposite bank of the river, is the town of Troy, which is at the head of the sloop navigation, and has a considerable trade, with a population of 11,605.

The following are the principal towns on the Mohawk and the Erie canal:—Schenectady, on the south bank of the river, 15 miles north-west of Albany, is the seat of Union College, and has a handsome covered bridge over the Mohawk, 1000 feet in length: the population is 4258. Utica, on the south bank of the same river, 94 miles west of Albany, has a population of 8323. At this point, the Mohawk river, the Erie canal, and the great western road meet. Syracuse, 133 miles from Albany, is extensively engaged in the manufacture of salt. Canandaigua, on the lake of the name, has a population of 6162. Rochester is on the Genessee river and on the Grand Canal, which passes over a noble aqueduct of stone at this town. It is 236 miles from Albany, 7 miles from Lake Ontario, and has a ship navigation within two miles of the town. Owing to the falls of the Genessee river, this place enjoys the advantage of abundant water-power for putting mills in motion and other purposes. Rochester was founded in 1812, and in 1830 it contained 10,885 inhabitants. Buffalo is at the north-eastern corner of Lake Erie, at the termination of the Grand Canal, and at the head of Niagara river. It carries on a considerable trade on the lake. [BUFFALO.] In the western part of the state there are numerous towns equal in magnitude to some of those which have been mentioned. They are all in a thriving condition, and owe their prosperity mainly to the Erie canal. In this district the traveller meets with numerous well-built villages, only a few years old, in a country which, not long since, was an uninhabited wilderness. The numerous lakes in this part of the state contribute to the beauty and variety of the landscape. Plattsburg, on the west side of Lake Champlain, has a population of 4913. Sackett's Harbour, near the mouth of Black River, at the east end of Lake Ontario, is considered to be the best harbour in that lake: the population is about 2938.

Population.—The population of the state of New York at each enumeration since the acknowledgement of American independence was as follows:—

	Free.	Slaves.	Total.	Increase per cent.
1790	340,120	21,324	361,444	
1800	586,756	20,343	607,099	67·96
1810	959,949	15,017	974,966	60·59
1820	1,372,812	10,088	1,382,900	41·84
1830	1,918,608	75	1,918,683	38·74

* Incorporated villages are governed by a president and trustees, who are annually chosen by the people. They differ from cities only in having more limited powers and jurisdiction. The term 'town,' in the New York law, is synonymous with 'township.'

The increase, comparing 1830 with 1790, has been 433⅓ per cent., or at the rate of 10⅓ per cent. annually.

At the last census, in 1830, the population was ascertained in classes, as under:—

	Males.	Females.	Total.
Free white population:—			
Under 5 years old ..	158,077	151,868	309,945
From 5 to 10 years ..	137,071	133,084	270,155
„ 10 15 „ ..	118,523	115,166	233,689
„ 15 20 „ ..	101,712	105,196	206,908
„ 20 30 „ ..	176,754	168,897	345,651
„ 30 40 „ ..	113,136	104,522	217,658
„ 40 50 „ ..	68,871	64,315	133,186
„ 50 60 „ ..	40,503	38,344	78,847
„ 60 70 „ ..	23,909	22,589	46,498
„ 70 80 „ ..	10,044	9,645	19,689
„ 80 90 „ ..	2,561	2,673	5,234
„ 90 100 „ ..	255	304	559
Over 100 . ..	35	17	52
Free coloured population:—			
Under 10 years old ..	5,643	5,509	11,152
From 10 to 21 years ..	6,094	6,843	12,937
„ 21 36 „ ..	4,860	5,504	10,364
„ 36 55 „ ..	3,492	3,780	7,272
„ 55 100 „ ..	1,358	1,714	3,072
Over 100 . ..	19	54	73
Slaves:—			
Under 10 years old ..	5	23	28
From 10 to 21 years ..	6	12	18
„ 21 36 „ ..	..	17	17
„ 36 55 „ ..	1	[illegible]	4
„ 55 100 „ ..	..	6	6
Over 100 . ..	1	1	2
Ages not ascertained			5,667
			1,918,683

Constitution, &c.—The present constitution of the state of New York was adopted in 1821. The executive administration is entrusted to a governor and a lieutenant-governor, who are elected by the people for two years. The legislature consists of a senate, of 32 members, who are chosen for four years; and an assembly, of 128 members, elected annually. The lieutenant-governor acts as president of the senate. For the election of senators the state is divided into eight districts, each of which sends four members, one of whom is elected every year. The members of the House of Assembly are elected by counties, in numbers proportioned to their population. The elections must be held in October or November, and the legislature must meet for business at Albany on the first Tuesday of January in every year.

The right of suffrage in the election of public officers belongs to every white male citizen of twenty-one years of age and upwards who has been an inhabitant of the state for one year and of the county for which he offers his vote for six months next preceding the election. Free men of colour, at least twenty-one years old, may vote if possessed of an unincumbered freehold estate worth 250 dollars.

For the administration of justice there are:—a chancellor and vice-chancellor; a supreme court, with a chief-justice and two associate-justices; and eight circuit-courts, one for each of the eight senatorial districts, with a judge for each. The judges are all appointed by the governor with the consent of the senate; they hold their offices during good behaviour, and until they shall be sixty years of age. Courts of common pleas are likewise held in each county in the state, for which purpose a first judge and four assistant-justices are appointed, each of whom holds office during five years.

With the exception of certain judicial and civil functionaries, ministers of religion, teachers in schools and colleges, and students, all able-bodied free white male citizens, between the ages of eighteen and forty-five, are subject to the performance of military duty in the militia. The number enrolled in the militia of the state at the beginning of 1839 was 176,115 men.

Inland Communication.—Great exertions have continually been made to extend the means of internal communication through the state, for which purpose the public money has been freely expended, and loans have been raised on the credit of the state. In the Report of the Canal Board, made to the legislature in 1837, it is stated that the length of canals, the property of the state, then finished and in operation, was 655 miles, the cost of which was 11,962,711 dollars. The state legislature began about twenty years ago this system of internal improvements, which has been carried on extensively and with great success. The first both in point of time and importance of its undertakings was the Erie Canal, which was begun in 1817 and finished in 1825. This canal, which connects the Hudson river with Lake Erie, is 360 miles in length, in the course of which an aggregate rise and fall of 662 feet is overcome by means of 81 locks: the difference of level between the Hudson and Lake Erie is 564 feet, the ascent of the canal to its summit-level being 613 feet, and the descent only 49 feet. The canal is throughout made 40 feet wide at the surface, 28 feet wide at the bottom, and 4 feet deep. Its course is as follows:—Beginning at Albany on the Hudson, it runs to the north along the west bank of that river to near the mouth of the Mohawk river, along the south bank of which it passes to the west through the counties of Albany, Schenectady, Montgomery, Herkimer, and Oneida to Rome; it then takes a south-west direction into Madison county, turns to the west, and passes through Onondaga county to within a mile of the Onondaga or Salt Lake, enters Seneca county, and crosses the Seneca river at Montezuma. Proceeding still to the west, it passes Lyons and Palmyra, and crosses the Genessee river at Rochester: its course is still to the west for 60 miles, when, turning to the south, it joins Tonnewanta Creek, 11 miles from the river Niagara. The Tonnewanta is used for 11 miles, when the canal leaves it and takes a southerly direction along the east bank of the Niagara to the termination of the canal at Buffalo on Lake Erie; thus connecting New York with the western states of the Union. New York is mainly indebted for this great work to Governor Clinton. [CLINTON.] The Champlain Canal joins the Erie Canal where its westerly course begins, near the confluence of the Hudson and Mohawk rivers; its course is nearly due north to Lake Champlain, comprising 4[illegible]½ miles of cutting and 15½ miles of natural channel rendered navigable. The cost of these two works was 9,123,000 dollars, which occasioned a debt by the state of 7,771,000 dollars. The tolls in the first year after they were opened amounted to half a million of dollars, and have since progressively increased, until, in 1838, they reached 1,518,300 dollars. There were at the time the Report of the Canal Board was made (1837) in progress towards completion other canals 168 miles long, the estimated cost of which was more than 3,000,000 dollars; and beyond this an enlargement of the Erie Canal had been authorised by the state legislature at an estimated expense of fifteen millions of dollars. There were also private canals finished to the extent of 122 miles, and in progress 28 miles. Of railroads finished, in progress, and authorised, belonging to private companies, there were, in 1838—

	Miles.	Cost.
Finished . .	218	5,065,000 dollars
In progress . .	938	16,000,000 „
Authorised . .	1704	31,064,000 „

The state derives a considerable and constantly increasing yearly revenue from its canals. The surplus tolls of the Erie and Champlain canals, after defraying all expenses, were, in 1829, 478,694 dollars, and in 1838, 901,999 dollars: the average annual profit of the ten years was 806,704 dollars.

Property.—The value of real and personal estate within the state, as assessed for taxation, was, in 1838—

Real estate . .	502,864,006 dollars
Personal . .	126,680,778 „
Total . .	629,544,784 „

and the amount of taxes levied upon the same for general and county expenditure was 2,860,478 dollars. This was a little short of one-half per cent. on the assessed value, and considered with reference to the population, not quite a dollar and a half (6*s.* 3*d.* sterling) for each individual.

Education.—The subject of education has long received the greatest attention on the part of the state legislature. For this purpose the state is divided into 10,583 school districts, which are required to make yearly returns of the number of scholars and the various expenses attending the same. In the year ending 30th of September, 1838, returns were made, by which it is shown that of 539,747 children between 5 and 16 years old, residing in those districts, there were taught in schools 528,913, or 48 in every 49. The amount

of public money appropriated to the schools in that year was 335,882 dollars, or equal to 70,000*l*.

There are in the state several public institutions for the purpose of education, in addition to those established in the city of New York. Among these the following are the most important:—

Union College, at Schenectady, was incorporated in 1794, and derives its name from the circumstance of several religious denominations having combined for its establishment. The buildings are two brick edifices, each 200 feet long and four stories high. Each building has two wings 150 feet wide. This college is liberally endowed. It has a library of nearly 6000 volumes, besides the students' library of 9000 volumes. The number of students is usually between 200 and 250.

Hamilton College, at Clinton, 9 miles from Utica, was erected in 1812. It is a large building four stories high, with a library of 6000 volumes. The number of students is about 100.

Geneva College, situated at the town of that name, was founded in 1825. The number of students is 44.

Hamilton Literary and Theological Seminary, situated in Madison county, 25 miles south-west of Utica, was founded by the Baptists, and incorporated in 1819. This building is of stone, four stories high, 100 feet long by 60 feet deep. The number of students is about 100.

The Theological Seminary at Auburn was founded by the Presbyterians in 1821. It has 54 students and a library of 1500 volumes.

The Hartwig Theological Seminary was founded under the will of the Rev. J. C. Hartwig, a Lutheran minister, who bequeathed a large estate in land for that purpose. It contains 90 students and has a library of 1000 volumes.

The United States Military Academy, at West Point on the Hudson, was established in 1802, on a tract of 250 acres of land ceded by the legislature of New York to the United States. The staff, including the superintendent and commandant, professors and teachers, comprises 40 persons, and the number of cadets is limited to 250. The regular course of studies occupies four years. Each cadet is appointed by the president of the United States.

Prisons, &c.—The prison discipline adopted in this state has attracted considerable notice on the part of foreign governments, many of which have sent commissioners to the United States for the purpose of acquiring information upon the subject. [AUBURN.]

Asylums for the insane poor have been founded in the state, one of which, the State Lunatic Asylum at Utica, is calculated for the accommodation of 1000 patients.

Paupers are supported by a tax on the inhabitants of the counties to which they respectively belong, and are placed under the care of superintendents specially appointed for the purpose. The several counties are provided with poorhouses, to which a farm is attached, and in which the paupers are collected. The whole number of paupers relieved or supported during the year 1836 was 37,959, of whom 20,554 belonged to the city of New York. The sum expended for their relief was 396,100 dollars (82,520*l*.), one-tenth part of which was repaid by the produce of their labour. Among the number just stated, there were 6874 foreigners, 786 lunatics, 271 idiots, and 77 deaf and dumb. The number who were in the poor-houses on the 1st of December, 1836, was—males 3714, females 3294; together 7008.

Public Debt.—The public debt of the state of New York, as it stood in June, 1838, amounted to 18,262,406 dollars, nearly the whole of which has been incurred for the promotion of public works, chiefly canals and rail-roads. The revenue derived from the state canals has been sufficient during the last six years to defray all expenses of repairs, to pay interest on the whole amount of the state debt, and to provide towards its extinction an average surplus of 610,000 dollars. About four millions and a half of dollars have been thus paid off since 1825.

(Darby's *View of the United States*; Warden's *Account of the United States of North America*; Fowler's *Journal of a Tour in the State of New York*; Redfield's 'Account of two Visits to the Mountains in Essex County,' in *Journal of Science and Arts*, vol. xxxiii.; *American Almanac for* 1839; *Official Papers and Reports*.)

NEW YORK, the largest city in the state of New York, and the commercial capital of the United States of America, is built on the point of Manhattan Island, at the confluence of the Hudson and East rivers, in 40° 41′ N. lat. and 74° 1′ W. long. It was founded in 1609, by a party of Dutch merchants, to whom the states general of Holland had granted a patent for the exclusive trade to Hudson's river, then called by the Indians the Manhattan; the same name was also then given to the island of New York. In 1621 an extensive but undefined territory on both sides of the Hudson was granted to the Dutch West India Company, and the city of New Amsterdam was built on the site of the former settlement. In 1664 a charter was executed by Charles II., conveying to the Duke of York the whole territory, from the eastern shore of the Delaware to the western bank of the Connecticut, and an armament was sent without delay from England to take possession of the country. At this time the Dutch and English were at peace, and this proceeding was justified on the ground that the whole territory of right belonged to the crown of England, having been discovered by the Cabots in the previous century, and that the Dutch settlers were intruders. After fruitless remonstrances on the part of the Dutch governor of New Amsterdam, Stuyvesant, the English obtained possession of the city and territory, and immediately changed the name of both to New York. The town at this time is said to have been handsome and well built, and to have contained 3000 inhabitants. Holland made no attempt at the time nor during the subsequent war to regain possession of the settlement, and at the peace of Breda it was formally ceded to England. In 1673, when England was again at war with Holland, the town was taken by a small Dutch squadron, not without suspicion of treachery, and without a shot being fired on either side. Peace being concluded in the following year, New York was restored to England. In 1682, the inhabitants having petitioned the Duke of York to give them some share in the management of their affairs, the same form of government was given to them as was already enjoyed by the other British plantations; a council was appointed by the proprietor, consisting of ten members; and a House of Assembly, composed of eighteen members, was chosen by the inhabitants, but the laws passed by these two bodies were to have no force until confirmed by the proprietor.

The citizens of New York early took part in the troubles that ended in the separation of the American plantations from England, and sent delegates to attend the general congress at Philadelphia, in September, 1774. In the summer of 1776 the English fleet under Admiral Howe, and the army under General Sir William Howe, having defeated the Americans under General Washington on Long Island, took possession of New York and retained it until the acknowledgement of American independence. The city was evacuated by the English on the 25th November, 1783, and was occupied by an American garrison the same day.

The island upon which New York stands is 15 miles long and from one mile to three miles broad. The city occupies the south part of the island; it extends along the Hudson about two miles, and along the East River, which divides it from Long Island, about four miles. The south-west part of the town, which was the earliest built, is ill-arranged, but the more modern parts are laid out with much regularity, and are well paved and lighted. Broadway, the principal street, which runs through the centre of the town, is three miles long and eighty feet wide. It contains several handsome churches, many of the principal hotels, and a great variety of elegant shops. Wall Street, which branches off from Broadway, contains the Exchange and most of the city banks, as well as the greater part of the merchants' and brokers' counting-houses, and the insurance offices. The City Hall, the front of which is of white marble, is 216 feet long, 105 feet wide, and 60 feet high. It contains the courts of law and the places of meeting for the municipal bodies. The building was begun in 1803, and finished in 1812, at the cost of half a million of dollars. The Merchants' Exchange, which was destroyed by the great fire that occurred on the 16th December, 1835, was also built of white marble; its front in Wall Street was 114 feet wide, and it extended in depth 150 feet; the basement was occupied by the Post-office. The Exchange, which occupied the centre of the building, was of an oval form, 85 feet long, 55 feet wide, and 45 feet high, surmounted by a dome, through which light was admitted. The building was begun in 1824 and finished in 1827. The fire by which it was destroyed began near Wall Street; the

number of buildings demolished was 529, valued at four millions of dollars, and the merchandise and other moveable property destroyed was valued at more than thirteen millions of dollars.

The population of the city in the years 1820, 1830, and 1835, as given in Williams's 'State Register,' was as follows:—

1820 . . .	123,706
1830 . . .	202,589
1835 . . .	270,089

	Dollars.
The value of the real estate assessed for taxation in 1835 was . .	143,732,425
And of the personal estate . .	74,991,278
Together . . .	218,723,703

The amount of taxes levied in that year for public and municipal expenses was 1,095,994 dollars. This is equal to one half per cent. on the value, and to four dollars on each individual of the population.

It appears from the bills of mortality printed in the city, that the deaths in proportion to the population were, in 1835, one in 38; and in 1836, one in 34. The ages at which the deaths occurred in 1836, were,

Under 1 year (including 506 still-born) .	2292
1 and under 2 years . . .	1014
2 „ 5	841
5 „ 10	315
10 „ 20	303
20 „ 30	927
30 „ 40	945
40 „ 50	551
50 „ 60	309
60 „ 70	233
70 „ 80	148
80 „ 90	75
90 „ 100	16
	7969

Of this number 4352 were males, and 3617 were females. The deaths in the first six months amounted to $\frac{7}{16}$ and in the last six months to $\frac{9}{16}$ of the number. Among the deaths 1514 were caused by consumption, 506 were still-born, 142 were the direct result of intemperance, 262 arose from accidents and violence, 33 were suicides, and only 131 are attributed to old age.

The mortality of the city would be lessened by the construction of sewers to carry off the filth which accumulates in all populous places. Some parts of the town are better cleansed and ventilated than others, and it has been remarked that the fever by which New York is sometimes visited always first shows itself in the most confined and dirtiest parts of the town. The situation of the town is by nature favourable to healthiness. The constant ebb and flow of the tide prevent all stagnation of the air, and while it is sufficiently protected from the occasional violence of the sea breezes, they are not prevented from visiting the town. The strength of the tide would greatly facilitate the removal of all noxious matters. The city is very ill supplied with water, but measures are in progress for remedying this deficiency.

The situation of New York as a commercial port is admirable. New York Bay, which is completely land-locked, is about 8 miles long and from 1½ to 5 miles wide, and affords a perfectly safe anchorage. It is easy of approach, and is very rarely closed by ice. The entrance between Long Island and Staten Island, by a channel called the Narrows, is protected by forts, while the approach to it is facilitated by lighthouses, one of which is placed on a long tongue of land on the New Jersey shore called Sandy Hook; two others are erected about four miles south from Sandy Hook, and their lights, being 250 feet above the level of the sea, can be seen in fair weather at 40 or 50 miles distance. A fourth light-house is placed on Staten Island, at the narrowest part of the entrance to the harbour. The bay contains several small islands, which have been surrendered to the general government as sites for fortifications. There is sufficient depth of water, both in the Hudson and East rivers, for ships of large burthen to load and unload at the wharfs. The commercial intercourse with the interior and with the western states of the Union is secured by means of the Hudson and the system of canals which has already been noticed.

The tonnage of vessels that entered and cleared in each of the ten years from 1827 to 1836, was as follows:—

	Entered.			Cleared.		
	American.	Foreign.	Total.	American.	Foreign	Total.
1827	261,301	39,242	300,543	239,968	33,375	273,343
1828	256,750	44,505	301,255	217,113	42,373	259,486
1829	259,382	30,219	289,601	219,674	32,855	252,529
1830	298,434	35,344	333,778	229,341	36,574	265,915
1831	315,972	77,719	393,691	254,331	72,444	326,775
1832	329,842	116,481	446,323	242,749	101,967	344,716
1833	454,218	161,949	616,167	384,175	153,566	537,741
1834	451,259	243,633	694,892	361,606	238,650	600,256
1835	676,173	337,575	1,033,749	589,855	343,078	932,933
1836	595,390	367,436	962,826	477,524	355,591	833,115

The value of imports and exports (stated in dollars) during the same period was as follows:—

	Imports.	Exports.		
	Foreign Goods.	American	Foreign.	Total.
1827	38,719,644	13,920,627	9,913,510	23,834,137
1828	41,927,792	12,362,015	10,415,634	22,777,649
1829	34,743,307	12,036,561	8,082,450	20,119,011
1830	35,624,070	13,618,278	6,079,705	19,697,983
1831	57,077,417	15,726,118	9,809,026	25,535,144
1832	53,214,402	15,057,250	10,943,695	26,000,945
1833	55,918,449	15,411,296	9,983,821	25,395,117
1834	73,188,594	13,849,469	11,662,545	25,512,014
1835	88,191,305	21,707,967	8,637,297	30,345,264
1836	118,253,416	19,816,520	9,104,118	28,920,638

The disparity between the value of the imports and exports here exhibited is compensated by disparity in the opposite direction, in the commercial dealings of other parts of the American Union. A great part of the returns from foreign countries for the produce of Louisiana, Alabama, Georgia, Carolina, and Virginia, which is shipped direct from the ports of those states, is made through New York.

There are in the city of New York 21 banks, with capitals amounting in the aggregate to 18,111,200 dollars. Three have severally a capital of 2 millions of dollars; two have each 1½ millions; two have 1 million each, and the remaining 14 have each capitals from 750,000 to 200,000 dollars. The liabilities of the whole in the month of December, 1837, including their capitals, amounted, according to a report made by commissioners to Congress, to 55,620,834 dollars. There are also 28 fire-insurance companies, with capitals amounting in the aggregate to 10,250,000 dollars, and 13 marine insurance companies, whose united capitals amount to 4,550,000 dollars.

New York contains several learned and scientific societies. Among these are,—

The New York Historical Society, founded in .	1804
New York Literary and Philosophical Society .	
American Academy of Fine Arts, founded in .	1808
National Academy of Design, founded in .	1826
American Lyceum, founded in . . .	1831
Medical Society of New York . . .	

The University of New York, incorporated in 1831, has a capital of 120,000 dollars, raised in shares of 25 dollars. It is governed by a council, consisting of the mayor of the city, 4 members of the common council, and 32 persons elected by the shareholders from among their own body. The University comprehends two departments, one of which embraces the higher branches of literature and science, and the other provides instruction in classical, philosophical, and mathematical knowledge, with a course of study in English literature. There were in 1837, in the two departments, 17 professors and 226 students.

Columbia College, which is an institution for general literary instruction, in the city of New York, was founded in 1754, under the name of King's College. There are also the College of Physicians and Surgeons, the Theological Institution belonging to the Episcopal Church, and the New York Theological Seminary.

The earliest newspaper published in New York, the 'New York Gazette,' appeared first in 1725 (some accounts say 1733), and was issued weekly. There are now fifty-three newspapers published in the city, eleven of which appear daily, ten twice a week, twenty-six are published weekly, six semi-monthly, and one monthly. The number of sheets printed annually is estimated at 9,536,000. A list was given in 1834 of fifty-one weekly, monthly, and quarterly journals, magazines, and reviews, devoted to science and literature, which were published in the city of New York; many of these have no doubt been discontinued, and others may have since supplied their places.

NEW ZEALAND. [ZEALAND, NEW.]

NEWARK-UPON-TRENT, a town in Nottinghamshire, having a separate jurisdiction, though locally in the southern division of the wapentake of Newark, on an arm of the Trent, 19½ miles north-east of Nottingham, and 124

from London, by Biggleswade, Norman Cross, Stamford, and Grantham.

Newark was considered by Dr. Stukely to have been a Roman town; but the correctness of this opinion is doubtful, though many Roman antiquities have been discovered here. The Dr. considered it to have been the Sidnacester of the Saxons, which others place elsewhere. The first undoubted mention of it is in the time of Edward the Confessor, when it had already acquired the name of New-erk, or New Work, in contradistinction to some town or building of older date in the neighbourhood. The manor at an early period belonged to the see of Lincoln, and Alexander, bishop of that see, built or perhaps enlarged and strengthened the castle of Newark in the early part of the twelfth century. The castle came, a short time after, into the possession of the crown, and in the time of king John was besieged by the barons in the interest of Louis the Dauphin. John, coming to its relief, died at Newark, A.D. 1216. On the conclusion of the treaty between Henry III. (son and successor of John) and the Dauphin, some of the English adherents of the latter, fearing punishment, seized the castle of Newark, where they were besieged by the king's guardian, the earl of Pembroke, and obliged to surrender. The castle was subsequently restored to the see of Lincoln, and, with the exception of a short interval in the reign of Edward III., appears to have continued in its possession until the reign of Edward VI., by whom the town was incorporated. It was at Stoke, near Newark, that Henry VII. defeated Lambert Simnel and his supporters, A.D. 1487. In the civil war of Charles I. the townsmen zealously supported the king, and received a garrison from the forces of the marquis of Newcastle, of from 4000 to 5000 foot and above 500 horse: there were plenty of cannon on the walls. The incidents of that war are noticed elsewhere. [NOTTINGHAMSHIRE.]

The town is seated on the right bank of a stream, which is usually regarded as an arm of the Trent, but ought rather to be considered as belonging to its tributary the Devon. Two small islands, with water-mills on them, opposite the town, are in the borough limits.

The borough comprehended, in 1831, the parish of Newark and a very small portion of the adjacent parish of East Stoke, viz. the site of the castle, and the islands with the mills. It had an area of 2080 acres, with 2022 houses, inhabited by 2087 families; the population was 9557, a very small portion agricultural. The commissioners for regulating the boundaries of municipal corporations have recommended a new boundary-line, excluding a rural district comprehended within the former limits, but for parliamentary purposes the former boundary remains unaltered.

Newark is irregularly laid out, and consists of several streets, with a market-place near the centre of the town. It extends in length about a mile along the bank of the river, and in some parts about half a mile in breadth from the bank inland. It is well paved, and lighted with gas, under the provisions of local acts, and is well supplied with water. The houses built of late years have been mostly of an inferior class.

The church is one of the largest and most elegant in the kingdom: it was in great part rebuilt in the time of Henry VI. and Henry VII.; but there are in it some remains of a previous edifice of Norman character. It is a cross church, and consists of nave and chancel, with large aisles, transepts, and some chapels, with a tower at the west end, surmounted with a lofty and elegant spire. The general appearance of the exterior is of perpendicular character; some portions however rather partake of the decorated character. The length of the church is 218 feet, the breadth of the nave and of the chancel, with their respective aisles, 77 feet, and the breadth between the extremities of the transepts 117 feet. The height to the summit of the steeple is 240 feet. The interior has some good wood screen-work, some antient stained glass, and some brasses and other antient monuments.

The antient castle stood near the bank of the river: the south-western angle, the western wall washed by the river, a considerable part of a tower at the north-western angle, and parts of the north side of the building, remain. The western wall exhibits three distinct stories or tiers of apartments. The architecture varies with the period of erection of the various parts: some of it is Norman, but other portions were probably erected just before the civil wars of Charles I. Part of the inner area of the castle is used as a bowling-green, and the remaining portion has been recently converted into a large and commodious cattle-market. Just below the castle is a neat bridge of seven semicircular arches over the river, built of brick and faced with stone. The approach to Newark from the north is by a causeway a mile and a half long, carried over the flat island formed by the main channel of the Trent and the Newark branch, and leading to the bridge: in this causeway are several bridges and arches, to give free passage to the waters when the floods are out.

There are a court-house, where the quarter-sessions for the division are held; a handsome town-hall, for the corporation business, the borough sessions, and assemblies; several dissenting meeting-houses and schools, &c., and St. Leonard's hospital or almshouses, built about the time of Charles I. There are some walls of an antient Augustine friary, now converted into a dwelling-house. The chapel of the antient hospital of the Knights Templars, converted into a dwelling-house, is yet standing.

The principal trade of Newark is in corn, malt, flour, coal, cattle, and wool. The market, which is on Wednesday, is well supplied with butcher's meat, fish, and poultry, and is one of the principal corn-markets in that part of the kingdom. There are six considerable yearly cattle-fairs. Large quantities of gypsum and lime-stone are obtained in the neighbourhood: the gypsum is burnt and pulverised for the use of plasterers and sculptors, and sent by water-carriage to London. Seventy men and boys are employed in plaster-pits and stone quarries. Bricks and tiles are also made, and there are two large iron and brass foundries in the town. The arm of the Trent which passes by Newark is navigable: there is a lock in it close to the town.

The corporation, under the Municipal Reform Act, consists of 6 aldermen and 18 counsellors; the borough, by the same act, was divided into three wards, the previous boundaries of the borough being retained; but the municipal boundary commissioners recommend narrower limits, and have proposed a new division into two wards. The corporation have no property of their own. There are valuable charity estates, from which the church is kept in repair, and the salaries of the church officers, including the organist and singing-boys, are paid. Out of these funds also the town is lighted and paved, a dispensary is partly maintained, and the grammar-school, including two exhibitions to one of the universities, besides the national schools for boys and girls, and an almshouse, containing 12 men and 12 women, are supported. The town returns two members to parliament. The right of voting, before the Reform Act, was in the inhabitants paying scot and lot: 1362 voters polled in 1830. The number of 10*l.* houses is above 500, and the number of registered electors in the year 1835-6, including 10*l.* householders and the remaining scot and lot voters, was 1293.

Borough sessions are held every quarter, and petty sessions twice every week; there is a court of record for civil suits under 300*l.*, and a court of requests, obtained in the last session of parliament, for the recovery of debts under 5*l.* The borough gaol is small and very defective in its arrangement. Its abolition has been recommended by the inspectors of prisons.

The court of election for the southern division of the county is held at Newark, which is also a polling-station.

The living of Newark is a vicarage in the archdeaconry of Nottingham, formerly in the diocese of York, but now in that of Lincoln, of the clear yearly value of 325*l.*, with a glebe-house. It is in the gift of the crown.

There were in 1833 one dame-school with 13 children; the endowed grammar-school with 37 boys; two national schools, one each for boys and girls, with 246 scholars; and nineteen other day or boarding and day schools with 760 to 780 children; one day and Sunday school held at the workhouse, with about 12 to 15 children in the week and 25 on Sundays; and five Sunday-schools, with 1157 children.

(Dickinson's *Newark; Parliamentary Papers; Communication from Newark.*)

NEWBURG. [NEW YORK.]

NEWBURY, a corporate town and parish in the hundred of Faircross and county of Berks, is seated on the right bank of the river Kennet, 16 miles west by south from Reading, and 50 west by south from London, direct distances. The town is antient, being supposed to have originated from the Roman station Spinæ, which name is still preserved in that of Speenhamland, a hamlet in the parish of Speen, and contiguous to the town of Newbury. As early

..s the time of William the Conqueror it was called Newbir or Newbyrig, and under that name was granted by the Conqueror to Ernulph de Hesdin. The principal streets are broad and well paved, and the town is lighted with gas. The church is a plain stone building, erected in the reign of Henry VII. There are several large malthouses and corn-mills, and there were formerly some woollen manufactories of importance; but they have long since disappeared.

In the great council convened at Westminster in the reign of Edward III., concerning trade and manufactures, Newbury had three representatives.

The average annual export of flour, malt, and unmanufactured grain is estimated at 7000 tons. The corn-market is held on Thursday. The fairs are held five times in the year. That in October is a statute fair for hiring servants. (Lysons.) The Kennet and Avon Canal passes through the town.

The police of the town was described in 1835 as insufficient, and considerable inconvenience was said to arise from the circumstance of the hamlet of Speenhamland forming part of the town without being subject to the jurisdiction of the corporate magistrates. The earliest charter of incorporation extant is that of 28 Elizabeth; the charter under which the corporation acted previously to the Municipal Reform Act is dated in the first year of the reign of James II. The revenue of the corporation, derived chiefly from the manor of Newbury, is only 120*l.* Prior to 1818 the corporation derived a considerable income from a toll upon all grain which passed through the town; but this was contested in the above year, and has not since been paid.

The population of the parish in 1831 was 5959. The parish is in the diocese of Salisbury. The living is a rectory, in the gift of the crown, and valued at 455*l.* per annum.

The 'corporation school,' as it is called, originated from a bequest of Mr. John Kindrick, in 1624, of the sum of 4000*l.*, to be applied by the corporation in furnishing employment to the poor of Newbury. Part of the revenue thence arising was first appropriated to the education and clothing of 20 boys in 1706. The funds of this charity were augmented in 1715 by certain landed property named in the will of Mr. Richard Cowslade, the rental of which in 1819 amounted to 97*l.*, and the number of boys clothed and educated was in consequence increased to 28. In 1790 there was a further bequest, by James Kimber, of funded property, yielding an annual dividend of 531*l.*, which he directed should be employed in the education, clothing, and apprenticing of ten boys. The boys on these three foundations form what is called the Newbury Blue-coat School. They meet in a room adjoining the church, and are taught by the same master reading, writing, and arithmetic. It is to be regretted that so little good should have been effected with such ample means. In 1819 none of the boys had been apprenticed; the master, who had held his situation for many years, was complained of as being neglectful of his duties. The annual expenditure on account of the charity had not exceeded 150*l.*, and the appropriation of the residue could not be satisfactorily accounted for in consequence of the funds of the charity not having been kept distinct from those of the corporation. For the other charities of Newbury, which include several almshouses, the reader is referred to the 'First Report of the Commissioners on Charities,' page 41.

In the reign of Edward I. Newbury returned two members to parliament. (Lysons' *Magna Brit.*, i., p. 319, given by him on the authority of Willis's *Notitia Parliamentaria.*) At what period it was disenfranchised does not appear. It is here that the Easter quarter-session for the county is held. The vicinity of Newbury is remarkable for the battles fought there in 1643 and 1644, between Charles and the parliamentary forces. (*Beauties of England; Parliamentary Papers,* &c.)

NEWBURY, PORT. [MASSACHUSETTS.]

NEWCASTLE, distinguished from other places of the same name as *Newcastle-upon-Tyne*, is locally in Castle Ward, in the county of Northumberland, of which county it is the assize-town. It is 274 miles from London, by Hatfield, Baldock, Stamford, Newark, Doncaster, Boroughbridge, Darlington, and Durham.

Newcastle appears to have derived its origin from Pons Ælii, the second station from the eastern extremity of the Roman wall. Several Roman remains furnish decisive proofs that it occupies the site of a station. Many coins were found in the piers of the old bridge thrown down by a flood in 1771, and the remains of a Roman well, two altars, fragments of walls, and large quantities of pottery, in digging the foundations of the new county court-house, A.D. 1810. Previous to the Conquest the place went by the name of Monkchester, from the number of monastic institutions. The town was also the resort of numerous pilgrims who came to visit the holy well of Jesus' Mount, now Jesmond, a mile north-east of the town. One of the principal streets in Newcastle is still called Pilgrim Street. There are considerable remains of the Black or Dominican Friary near Low Friar Lane. Another antient town, called Pampedon, appears to have been included in the limits of the modern Newcastle: this place was in the manor of Byker; its name is retained, though in a somewhat altered form, in the modern Pandon Hall, Pandon Bank, Pandon Dean, &c. It was from a fortress built by Robert, eldest son of William the Conqueror (A.D. 1079 to 1082), on his return from an expedition into Scotland, to which, in contrast to some more antient erection, the name of the *New Castle* was given, that the town derived its present name. In the rebellion of Mowbray, earl of Northumberland, against William Rufus, this fortress was taken by the king (A.D. 1095). In the reign of Stephen it came into the hands of the Scots, but in the reign of Henry II. (A.D. 1174), and John (A.D. 1213), it was repaired and strengthened. In the reign of Edward I., John Baliol did homage at Newcastle for his crown of Scotland. The town had been early incorporated, probably by William Rufus, but the first mayor was appointed in the reign of Henry III. (A.D. 1251). Edward I. gave the lands and tenements of Pampeden to the burgesses (A.D. 1299). The walls of the town, which had been erected perhaps in Rufus's time, were rebuilt on the eastern side, and it is likely that a portion of the old Roman wall of the station Pons Ælii was incorporated with them. Several of the early Anglo-Norman kings coined money at Newcastle.

In the reign of Edward III. the town was attacked, but without success, by David Bruce (A.D. 1342), in his invasion of England. At the siege of Calais (A.D. 1346) Newcastle furnished 17 ships and 314 mariners, a greater force than any other northern port except Yarmouth. In the wars with Scotland, Newcastle was a frequent place of rendezvous to the English forces, and it was the scene of several diplomatic meetings. In 1636 above 5000 persons died of the plague at Newcastle, an indication of the extent and population of the town. In 1640 it was deserted by the king's forces and occupied by the Scots, who had invaded England. In 1641 the Scots quitted the town, which in the ensuing civil war supported the king with great zeal. In 1644 it was besieged by the Scots, who had come to the support of the Parliamentarians, and taken by storm. In 1646 King Charles was brought hither from Newark by the Scots, to whom he had surrendered himself. In the Rebellion of 1715 the townsmen armed for the support of the government, and the place was occupied by a body of troops under General Carpenter. In 1740 a serious riot took place on account of the dearness of provisions. In the Rebellion of 1745-6 the town was occupied by the militia of the county, and by a regular military force under Marshal Wade.

The town has been more than doubled in size, and nearly so in population, during the present century. It is situated on the summit and declivities of three lofty eminences, rising from the north bank of the Tyne, and ten miles from its mouth. It extends about two miles along the bank. The town of Gateshead, in the county of Durham, occupies the opposite bank, and may be regarded as a sort of suburb of Newcastle. [GATESHEAD.] The limits of the municipal borough formerly included the town and county of the town of Newcastle, having an area of 2000 acres. The Boundary Act added to this, for parliamentary purposes, the townships of Elswick, Westgate, Jesmond, Heaton, and Byker; and these townships have been since added to the municipal borough, making the total area 4936 acres. The population, in 1831, was as follows:—County of the town of Newcastle, 42,760; townships of Elswick, 787; Westgate, 2996; Byker, 5176; Heaton, 501; Jesmond, 1393; total, 53,613. The population of Gateshead at the same time was 15,177: making a total of 68,790. At present, taking into account the rapid increase of buildings, the population of Newcastle and Gateshead, with the adjacent villages, comprising a dense population, chiefly of colliers, may be estimated at 100,000.

In the central part of the town, which is the oldest, the streets are inconveniently narrow, and lined with old houses. Considerable improvements have however been made, and new streets have been opened in this part. In the upper and more modern parts of the town are spacious streets and squares, with regular ranges of elegant buildings. The most splendid of these streets, superior indeed to most streets in other provincial towns, is Grey Street, so named in honour of Earl Grey. The whole is well paved, and lighted with gas; the paving and lighting, which are described in the Municipal Commissioners Reports as indifferent, in many parts have been much improved since their visit. (*Municipal Commissioners' Reports.*) The principal improvements have been on the northern side of the town, where the corporation have erected a new market-house, and entire streets have been built of shops and houses of a superior description. A group of entirely new and uniform buildings, called Brandling Place or Village, has been erected in Jesmond township, north of Newcastle; and there is another assemblage of new and respectable houses on Rye Hill, in Westgate and Elswick townships, west of the town. The additions to the town eastward, along the bank of the river, are chiefly for commercial or manufacturing purposes. The improvements effected within the last five years have been very great, and many of them, as well as of preceding improvements, owe their origin to the skill and enterprise of a single individual, Mr. Grainger, a builder of Newcastle. The town is connected with Gateshead by an elegant stone bridge of nine elliptic arches, erected (A.D. 1776-1781) in place of a former bridge destroyed (A.D. 1771) by a great land-flood. It was widened in A.D. 1801. There are two streams running into the Tyne, one of which, the Pandon Burn, flows on the north side of the town, and is crossed by the high north road at Barras Bridge, and then, turning south, runs through or rather under one part of the town (for it is arched over) into the Tyne, about a quarter of a mile below the Tyne bridge; the other, the Ouse Burn, runs on the east side of the town, dividing the township of Jesmond from those of Heaton and Byker, and is crossed in several places by bridges over which roads lead from Newcastle to the places adjacent. It joins the Tyne half a mile below the Pandon Burn. A handsome bridge of three arches, built A.D. 1812, spans the deep and narrow valley of Pandon Dean.

Newcastle is adorned by a variety of public buildings. The church of St. Nicholas, in the centre of the town, is a large and handsome cross-church, 245 feet in length: it is chiefly of decorated English character. The steeple, which is at the west end, 201 feet high, is the most beautiful feature in the building, and is of late perpendicular. At the corners of the tower are bold buttresses, crowned by octagonal turrets with crocketted pinnacles: from the base of these turrets spring four flying buttresses, crocketted and peculiarly graceful in their forms; and on the intersection of these is placed a lantern crowned with a crocketted spire, and four crocketted pinnacles at the corners. This steeple has been imitated in those of St. Giles at Edinburgh, and St. Dunstan's in the East in London, and in other places; but the imitations fall far short of the original. The choir of the church, 110 feet long and 64 feet wide, is enclosed for service; the nave, 110 feet long and 74 feet wide, is without seats; the interior is adorned by a painted east window representing Christ bearing the cross, an altar-piece of the Last Supper, and several monuments. St. Andrew's church, on the north-west side of the town, is a very antient structure, part of it being of Norman architecture, but it has undergone repeated alterations and repairs. St. John's, near the west gate, is a large cross-church, chiefly of early English character, with a square embattled tower. It contains an antient font and several antient monuments. All Saints church, near the centre of the town, is a modern edifice of Grecian architecture, with a steeple 202 feet high. The interior is an ellipse 80 feet by 60. St. Ann's chapel is a plain building, with a light steeple, on the east side of the town, near the Ouse Burn. St. Thomas's chapel, lately erected in the Magdalene Meadows, near Barras Bridge, on the north road, in place of a chapel near the Tyne Bridge, now pulled down, is a beautiful building in the early English style, with a lofty tower. There are a number of dissenting places of worship, but none of them have any architectural claims to notice. The Guildhall, Exchange, and Merchants' Court, or hall of the incorporated company of hoastmen, form an extensive range of buildings, erected, altered, and enlarged at various periods: they contain several portraits of historical interest. The Mansion-house, a commodious brick building, near the river Tyne, is now disused as the residence of the mayor, and let for a warehouse. The town and county gaol is a massive stone building of modern erection, large and commodious, and admitting the requisite classification. The moot-hall, or County Court-house, erected in part of the precincts of the antient castle, is a building of elegant proportions, adorned with a fine portico of six Doric columns on the south front, and a similar portico of four columns on the north front. The architectural details are from the temple of Theseus at Athens. Much of the old castle, which was formerly used as a county prison and for holding the assizes, is yet standing; many alterations have been made in it within the last twenty or thirty years, but by no means in harmony with the original architecture of the building, which is Norman. The walls have a thickness varying from 14½ to 17 feet.

The Infirmary is a commodious and handsome building in the Westgate township: the institution is well managed, and all requisite accommodations for the patients are provided. The in-door patients average about 800; the out-patients about 700. There are a dispensary, a small lying-in hospital, a lunatic asylum under good management and well provided with accommodations, several ranges of alms-houses, and other charitable institutions: the keelmen's hospital, for poor keelmen; Jesus' hospital, for decayed freemen, their widows and children; the Trinity almshouses; and the Westgate hospital (the last founded in commemoration of the peace of 1814), are the principal of these. The Literary and Philosophical Society, instituted A.D. 1793, occupies a handsome building of Doric architecture, comprehending a museum, a library, and other apartments. This society owes its origin chiefly to the Rev. Wm. Turner, a dissenting minister in the town. It was established in 1793; and the present building was erected 1822-25. Adjoining the library of the Literary and Philosophical Society are the rooms and museums of the Natural History Society of Northumberland, Durham, and Newcastle, and of the Antiquarian Society of Newcastle. There are a handsome theatre, assembly-rooms, and a riding-school, formerly a circus; public baths near the head of Northumberland Street, and a stand upon the race-course north of the town. There are extensive barracks, enclosed within a stone wall, north-west of the town. The royal arcade, an extensive pile of building, lately erected, is occupied by shops and offices. Two public cemeteries have been formed of late years near the suburbs of the town.

The commercial importance of Newcastle arises from its situation on a river navigable thus far by sea-borne vessels of 400 tons. The Tyne forms the haven, and is under the care of the corporation. The river side is lined with warehouses and extensive quays. The chief business is in the shipment of coals, the produce of the surrounding coal-pits. The coals are brought down the river in broad vessels called keels. The boatmen are called keelmen. The yearly export of coal in the ten years ending with 1832 averaged above 700,000 chaldrons sent coastwise, about half to London; the export over sea to the different countries of the Continent rose from about 45,000 to above 70,000 chaldrons in the same period. In 1833 the quantity sent coastwise was 1,921,848 tons; in 1834, 2,017,452 tons; in 1835, 2,261,401 tons; in 1836 2,280,713 tons; in 1837, 2,392,494 tons; and in 1838, 2,450,778 tons; the exports to foreign parts in the same years were 230,434, 227,444, 309,536, 415,849, 476,157, and 554,175 tons respectively. The other chief articles of export are lead, the trade in which has much increased; cast and wrought iron; glass and pottery, copperas and other chemical productions; soap, colours, grindstones, salt, and pickled salmon. The imports are wine, spirituous liquors, and fruit from the south of Europe; corn, timber, flax, tallow, and hides from the Baltic; and tobacco and various other articles from North America. The gross receipts at the custom-house for the years ending 5th January, 1836 to 1838, were 307,274*l.* 19*s.* 3*d.*, 413,796*l.* 17*s.* 6*d.*, and 379,360*l.* 19*s.* 8*d.* respectively; the net receipts of the same years were 293,087*l.* 7*s.* 7*d.*, 396,533*l.* 2*s.* 6*d.*, and 361,311*l.* 8*s.* 8*d.* These receipts were not exceeded by those of any other ports in Great Britain, except London, Liverpool, Bristol, and Hull, in England; and by Greenock, Leith, and Glasgow, in Scotland. The number of ships which entered the port in the years 1832-8 was as follows.—

	British.		Foreign.		Total.	
Years.	Vessels.	Tonnage.	Vessels.	Tonnage.	Vessels.	Tonnage.
1832	432	68,975	323	33,402	755	102,377
1833	506	80,285	261	31,804	767	112,089
1834	425	69,293	445	45,458	870	114,751
1835	466	75,352	348	37,159	814	112,511
1836	702	113,992	585	58,703	1207	172,695
1837	921	140,704	688	76,404	1609	217,108
1838	944	145,940	891	96,064	1835	242,004

Three or four vessels are sent every year to engage in the Davis's Straits whale-fishery. The salmon-fishery on the river has much declined. A number of steam-boats ply between Newcastle and Shields.

The chief manufactures are of glass-bottles and plate and crown glass, chiefly carried on in the township of Byker; this manufacture employed, in 1831, 350 men. The manufacture of steam-engines, mill-work, and other machinery employed from 130 to 140 men in 1831; and the different branches of the manufacture of leather, about 200 men. A number of persons were engaged in ship and boat building, block, mast, and sail making, flax-dressing, rope-making, coach-building, &c. There are several malt-houses, breweries, flour-mills, cooperages, printing-offices, and iron and lead-works, and chemical works. The lofty chimneys of these last, rising from 150 to 300 feet, form a striking feature of the town, and from the flatness of the surrounding country are seen at a great distance. (*Pop. Returns for* 1831.) Fire-bricks, coal-tar, and brown paper are made. Thirty years ago, the bricklayers' and slaters' labourers were chiefly females.

The inland trade of the town is considerable: there are two weekly markets, Tuesday and Saturday: the corn-market is a very important one; the market for wheat and rye, and that for oats, are held in different places; there is a handsome and commodious fish-market under the merchants' court, and large and commodious markets for butcher's meat and vegetables have been lately erected. There are several yearly fairs for woollen cloth, hardwares, leather, horses, and cattle. There are rail-roads from Newcastle to Carlisle, to North Shields, and to South Shields and Sunderland. Parliamentary sanction has been obtained for a railway from Newcastle to York. A Chamber of Commerce has been established for many years.

By the Municipal Reform Act, the borough was directed to be divided into seven wards; the corporation to consist of fourteen aldermen and forty-two councillors; by the revising barristers, agreeably to the permission given in the act, the number of wards was fixed at eight, but the alteration was not approved by the king in council. The revenue of the corporation averages from 30,000*l.* to 35,000*l.* per annum: the principal sources are rents (about 9000*l.*), a duty on coals and other goods exported (about 11,000*l.* of which 7000*l.* is coal duty), payments for liberty to deposit ballast (8000*l.*), tolls (nearly 2000*l.*), &c. The chief expenditure is for port and harbour charges (8000*l.* to 9000*l.*), repairing and cleansing the streets (4500*l.* to 5000*l.*), annuities and interest (about 8000*l.*), and charges on hospitals, schools, clergy, &c. (about 2500*l.*), the mayor's salary and expenses (above 3000*l.*), other salaries (about 3500*l.*), general repairs and improvements (above 2500*l.*), &c. (*Rep. of Municip. Commissioners.*)

Newcastle-upon-Tyne is a town and county; the assizes and the Epiphany quarter-sessions for the county of Northumberland are held in the Moothall, which is built on a piece of ground in the jurisdiction of Northumberland, though surrounded by the buildings of Newcastle. Assizes and quarter-sessions for the borough are held in the Guildhall at the usual periods; the recorder presides. There are a mayor's court and a sheriff's court, which have jurisdiction in suits of unlimited amount; a court of conscience for small debts under 40*s.*; and a court of conservancy for the river. There is a police force of 7 serjeants-at-mace and 80 constables, and a night-watch.

St. Nicholas is the mother-church of Newcastle: the benefice is a vicarage (united with the curacy of Gosforth) of the clear yearly value of 753*l.* with a glebe-house; and the vicar has the right of presentation to the perpetual curacies of All Saints (clear yearly value 330*l.*), St. Andrew (227*l.*), St. Ann (110*l.*), St. John, and St. James (244*l.*).

Besides the Philosophical Society and Antiquarian Society, there are a literary, scientific, and mechanical institution, an institution for the promotion of the fine arts, a Botanic and Horticultural Society, a Law Society, a Natural History Society, and a Philharmonic and Choral Society. There are several libraries connected with various public bodies, beside subscription news-rooms.

The total number of the day-schools of all classes (including boarding-schools) in the town and county of the town, in 1833, was ninety-six; of Sunday-schools twenty-one; in the added townships there were twenty-seven day-schools and nine Sunday-schools: making a total of one hundred and twenty-three day-schools and thirty Sunday-schools. The free grammar-school (in which the late lords Eldon, Stowell, and Collingwood, the poet Akenside, and other eminent persons received the earlier part of their education) was founded by Thomas Horsley, who was mayor of Newcastle in 1525. The Jubilee school is a Lancasterian school, established on occasion of the Jubilee, A.D. 1809, and supported by subscription, with a handsome school-house and a good library: the clergy Jubilee school, built to commemorate the fiftieth year of the prelacy of Dr. Shute Barrington, bishop of Durham, is a national school supported by an endowment and by subscription. There are several endowed schools and schools supported by subscription, including three infant-schools. There are a number of other benevolent societies.

(Brand's *History of Newcastle; Guide to Newcastle and its Environs*, by T. Sopwith, 1838; *Historical and Descriptive View of Northumberland*, Newcastle, 1811; Rickmans' *Gothic Architecture; Parliamentary Papers.*)

NEWCASTLE-UNDER-LYME,* a borough, market-town, and parish of Staffordshire, in the hundred of Pirehill, 150 miles from London on the road by Daventry, Coventry, and Lichfield, to Liverpool.

This place is of considerable antiquity, and was a corporate town as early as the reign of Henry II. It is referred to as such in a charter granted in that reign to Preston in Lancashire. The earliest extant charter to Newcastle is dated 19 Henry III., 1235. At a later period of the same reign a castle was built (or probably rebuilt) here by Edmund earl of Lancaster, the king's second son. The records of the borough are extant from 1386.

The town is situated about two miles from the right or west bank of the Trent, not far from the source of that river, and consists of several streets irregularly laid out, but well paved, and lighted with gas. It is supplied with good water. The houses are mostly old, but not deficient in neatness or uniformity. High-street along the Liverpool road is tolerably spacious. The town has two churches. One was rebuilt early in the last century, but has a lofty square tower of much greater antiquity, built of red-sandstone. The other church was built a few years since. There is a Catholic chapel, built in 1834, which is a Gothic building, constructed of ornamental bricks; and there are meeting-houses for Independents, Baptists, Unitarians, and several branches of the Methodists. There are a guildhall, having a clock with an illuminated dial, and a public office for the mayor and magistrates. There is a range of alms-houses for twenty alms-women, founded by Christopher Monk, duke of Albermarle, son of the famous George Monk. There are no vestiges of the antient castle except only a portion of the mound on which it was built, the rest having been levelled into the moat for purposes of cultivation.

The population of the borough, which is coextensive with the parish, was, in 1831, 8192; at present it is probably about 10,000. In 1831, 784 men were engaged in manufactures. The chief manufacture is that of hats. There are three silk-mills, a cotton and a paper-mill, the latter chiefly for the manufacture of a tissue-paper used in the potteries for printing the ware. A small portion of the inhabitants are engaged in the potteries. Markets are held on Monday and Saturday in the High-street. Besides the five annual fairs there are now five additional moveable cattle-markets held during the year. The town was formerly regarded as the capital of the pottery district, which is immediately

* Old records point to an antient forest, or woodlands, originally separating Cheshire from the rest of England called *Lime*, probably from its standing on the *limes*, or border. It has been conjectured, with much probability, that a number of places situated on or near the tract formerly occupied by these lime woodlands have derived the addition of lyme (which is the most antient and authentic form), lyne, or line, to their names from such proximity.

Besides Newcastle-under-Lyme we have Ashton-under-Lyme, now under-Line, Burslem, antiently Burr-wardes-lime (the Saxon word *Bur* signifying a bower, cottage, or dwelling; *Wardes*, towards; and *lime*, the woodland tract). Madely-under-Lyme, Whitmore-under-Lyme, Norton in Salop (described in the Cartulary of St. Peter's Abbey, Shrewsbury, as Juxta nemus quod Lima dicitur), Helton-under-Lyme, and Audlem (Old Lyme).

adjacent; but this connection has been gradually diminishing of late years, much to the detriment of Newcastle. A still more serious loss to the town has arisen from travellers being now nearly altogether diverted from it to the Grand Junction Railway.

There is a branch canal from this town to the Grand Trunk (or Trent and Mersey) Canal, which passes through the neighbourhood; and a canal from the coal-mines in Apedale, which affords a supply of coals to the town at a cheap rate.

The corporation, under the Municipal Reform Act, consists of six aldermen and eighteen councillors. The borough, by the same act, was divided into two wards, and the municipal boundaries were made coextensive with the parliamentary boundaries, which had been somewhat enlarged by the Boundary Act. The borough has a commission of the peace, and a good police: quarter-sessions and petty-sessions are regularly held. The corporation revenues are about 600*l.* per annum, a sum which is inadequate to meet the annual expenditure of salaries, rent charges in satisfaction of charitable bequests, &c.

Newcastle has returned members to parliament from 27 Edward III., and probably from an earlier date. The constituency, previous to the Reform Act, consisted of the resident freemen; the number was about 800. The number of houses, in 1831, assessed at 10*l.* annual value, was 267; the number estimated to be of that value was 360. Amongst other privileges, the burgesses have an exclusive right of pasturage on about 205 acres of fertile land, divided into four large fields, which were allotted to them under the Enclosure Act of 1816, in lieu of their antient right to one-third of the pasturage of about 600 acres, called the Town Fields. At the same time five acres, bordering the town on its eastern side, were set apart for public walks, together with funds for their support, and are now planted and laid out in an ornamental manner, to the great advantage of the inhabitants.

The living is a rectory, of the clear yearly value of 285*l.*, with a glebe-house, built in 1698.

There were, in 1833, in the borough, an infant-school, with 100 children; an endowed free grammar-school; four other schools, partly supported by endowment, with 118 children; nineteen other day-schools, with 499 children; one boarding-school, with 43 children; one national day and Sunday school, partly supported by endowment and partly by subscription, with 408 children in the week, and 625 on Sunday; and five Sunday-schools, with 1106 children. A Lancasterian school has been opened since these returns were made. There are a theatre; a permanent Book Society, established in 1815, having a library of upwards of 1500 volumes; and a Literary and Scientific Institution, founded in 1836, which also possesses a library. (*Communication from Newcastle-under-Lyme.*)

NEWCOME, WILLIAM, born 1729, died 1800, one of the eminent divines of the eighteenth century belonging to what was called the Liberal school, to which such men as Law, Paley, and many others belonged. The scene of his labours lay for the most part of the active period of life in Ireland, where he attained the highest dignity in the Church, being appointed archbishop of Armagh during the short administration of Earl Fitzwilliam in 1795.

His father was a clergyman at Abingdon, and he was educated at the grammar-school in that town, from whence he passed to the university of Oxford, where he became in due time a Fellow and tutor of Hertford College, where he had Charles James Fox for one of his pupils. In 1765 he became Doctor in Divinity, and in that year accompanied his patron, the earl of Hertford, when he went lord-lieutenant to Ireland. He went as chaplain, and a bishopric in that country soon falling vacant, he was placed in it: it was the see of Dromore. Entering the episcopal order thus early in life, it is not extraordinary that he had several translations, which were first to Ossory, then to Waterford, and finally to Armagh. A writer of some account of his life assures us that he 'diligently and faithfully discharged the duties of his episcopal office, and secured the respect of all parties and of all religious persuasions by the affability, prudence, candour, and moderation which were the invariable guides of his conduct.'

But the best praise of this eminent prelate is, that he was during the whole of his life a most assiduous biblical student, and that he did not suffer those studies to end in themselves, but laid before the world results which ensued upon them. He did not begin to lay these results before the public till he had maturely considered them, for he was nearly fifty before he printed any considerable work; but when he had begun, he showed that it was his great object to promote the knowledge and study of the Scriptures. His first work was 'The Harmony of the Gospels,' a work the title of which affords but an inadequate idea of its nature and contents, as, besides containing the results of his inquiries on a very difficult and important point of sacred history, it contains a great mass of valuable criticism and useful information. Out of this work arose a controversy with an acute antagonist, Dr. Priestley, on the duration of the ministry of our Savour; Bishop Newcome contending for three years, and Dr. Priestley limiting the time to one year. In 1782 he published his 'Observations on our Lord's Conduct as a Divine Instructor, and on the Excellence of his Moral Character,' a work of great beauty; and in 1785 a new version, with critical remarks, of the Twelve Minor Prophets. This was followed in 1788 by a similar work on the prophet Ezekiel. In 1792 he published his 'Review of the Chief Difficulties in the Gospel History relating to our Lord's Resurrection;' and in the same year, 'An Historical View of the English Biblical Translations.' This was his latest publication, except an Episcopal Charge; but after his death there was given to the world a very important work, which he had himself caused to be printed four years before his decease, entitled, 'An Attempt towards revising our English Translation of the Greek Scriptures,' in which he set the example of taking the benefit in an English version of those changes in the Greek text which the critical examination of existing manuscripts has shown to be expedient and necessary.

NEWFOUNDLAND, an island belonging to the British, is situated in the Atlantic Ocean, not far from the eastern shores of North America, between 46° 40′ and 51° 37′ N. lat. and 52° 25′ and 59° 15′ W. long. It is nearer to Europe than any of the islands, or any part of the continent, of America, the distance between St. John's and the harbour of Valencia in Ireland being only 1656 sea-miles. On the north-east, east, and south it is surrounded by the Atlantic Ocean. On the west of it lies the Gulf of St. Lawrence, which communicates at the northern extremity of the island with the Atlantic by the strait of Belle Isle, which is about 60 miles long and 12 broad, and deep and safe as a passage to and from the Gulf of St. Lawrence. Cape Rays, the south-western point of the island, is about 70 miles from North Point in Cape Breton; and this wide expanse of water unites the Gulf of St. Lawrence to the Atlantic on the south side of the island. The surface of Newfoundland is estimated at nearly 60,000 square miles, or something more than the area of England and Wales together. Its form approaches to that of a triangle.

The shores are rocky and high, and indented by broad and deep bays, which enter from 40 to 60 miles into the body of the island. The lands adjacent to the sea are bleak, rugged, and nearly destitute of trees or bushes; but at the heads of the bays and near the mouths of the rivers there are flats of some extent covered with trees. The interior of the island is nearly unknown: it seems to be diversified by hills, rivers, and numerous lakes. Towards the eastern coast the hills are low, and there are many trees of small growth; but towards the western coast it is more rugged, and the hills frequently rise to the height of mountains, and have little wood until within a few miles of the coast. The most elevated part is the northern peninsula, which lies along the Strait of Belle Isle. Towards the centre of the island there are flats of considerable extent, swampy, and mostly covered with peat. The hills and mountains do not generally form ridges, but each elevation seems to have its own peculiar base.

The climate of Newfoundland is influenced by its geographical position, by its exposure to the atmosphere of the Atlantic, and by the large fields of ice which, during the months of March, April, and May, are on their way from the northern shores towards the south, and cover the sea adjoining the island to a great distance. Great humidity prevails whenever the wind blows from the sea; and though the cold during the winter is severe, the harbours are not frozen so long as the most southerly of those within the Gulf of St. Lawrence. The cold is rather greater on the western coast and in the interior, but the atmosphere is generally clear and pure. During the summer months the days and nights are, with few exceptions, very pleasant.

At mid-day it is frequently very hot, and even oppressive; but in the mornings and evenings, and at night, the air is exceedingly agreeable. The most disagreeable periods are the setting-in and the breaking-up of the winter, and especially when the great islands of ice appear off the coast.

The climate is not too severe to allow cultivation, but it has hitherto been attempted only on a moderate scale. At the heads of the bays and along the lower course of the rivers there are many tracts of alluvial soil, which, with some outlay, could be converted into meadows, and if drained of the water which covers them when the snow dissolves, would yield good barley, oats, and potatoes. In many parts there is rich pasturage. Trees of any considerable size are only found within the bays, near the water, and along the rivers. On the Atlantic coast there is little wood of any value, except for fuel and the building of small boats. Spruce, birch, and larch compose the woods. Pine is rare and of small growth: mountain-ash is still less common. On the high unwooded grounds wortleberry-bushes predominate.

Deer are numerous, but beavers are not so common as they were formerly. Foxes are still numerous along the rivers and sea-coast. Fishing is at present almost the only occupation of the inhabitants: they take seals on the floating ice-fields in the spring, and cod in the summer along the eastern and southern coasts of the island, the coast of Labrador, and the Great Bank. The salmon, herring, and mackerel are also taken.

Coal, gypsum, and limestone are found in several districts, especially on the western coast, near St. George's Bay.

In the interior of the southern districts there is still a native tribe, the *Mic-mac*, who also occupy the peninsula of Gaspe, in Lower Canada, and extend into New Brunswick. The northern districts were formerly occupied by another tribe, called the Red Indians; but notwithstanding the careful search which was made some years ago to find out some individuals belonging to this tribe, none have been found, and it seems that the tribe is entirely extinct. The European settlers, all of whom are employed in the fisheries, are established on the coast, and especially on the peninsula of Avalon, which is united to the main body of the island by a low isthmus little more than three miles wide. This isthmus separates Trinity Bay from the bay of Placentia. The settlements on the other coasts are few and at a considerable distance from one another.

The port and town of St. John's is on the east side of the island. The entrance of the harbour is so narrow, that two large ships can hardly pass abreast with safety. There are twelve feet water in the middle of the channel. The harbour is spacious, and sheltered on all sides by high rocks: its fortifications are rather strong than extensive. The town runs along nearly the whole of the north side of the port, but there can scarcely be said to be more than one street, the others being irregular lanes. A few of the houses are of stone or brick, and some of the buildings are handsome, but the greater part are of wood. The public and government buildings are tolerably extensive. The population in summer hardly exceeds 10,000, but on the return of the fishermen it is increased to 15,000. Harbour Grace, the next town in importance, has a population of 5000; it is situated on the western shores of Conception Bay, and the harbour is safe, but rather intricate. The other settlements are small, and chiefly consist of a few wooden houses.

The Great Bank of Newfoundland is the most extensive submarine elevation that is known to exist in any ocean. It is about 600 miles long, and in some places 200 broad. The soundings on it are from 25 to 95 fathoms. The whole appears to be a mass of solid rock; its edges are abrupt, and deepen suddenly from 25 to 95 fathoms. The shallowest parts are the Cape Race, or Virgin Rocks; although there is about four fathoms on the shoalest parts, yet during a heavy sea, a ship would be immediately dashed to pieces on them. The best fishing-grounds on this bank are between 42° and 46° N. lat. The Outer Bank seems to be a continuation of the Great Bank at a lower elevation. It lies between 44° 15′ and 45° 24′ W. long. and 44° 10′ and 47° 30′ N. lat. The soundings on it vary from 100 to 160 fathoms. Between the Outer and Great Bank the soundings vary from 120 to 218 fathoms. From the Great Bank to Nova Scotia there is a continuation of banks. The temperature of the water on the Great Bank is from 10 to 12 degrees colder than that of the surrounding sea; and when it comes into contact with the warm waters of the Gulf-stream, at its southern extremity, the difference amounts to 16 or 18 degrees. It is supposed that the fogs which generally hang over the banks, and hover along the coasts of Nova Scotia, Cape Breton, and Newfoundland, are produced by the vapours which arise from the meeting of the warm waters of the Gulf-stream with those which are brought down from the polar regions by the prevailing north-eastern winds. [FISHERIES.]

The first discovery of Newfoundland is due to some Norwegians, who, before the year 1000, sailed on a voyage of discovery from Greenland, and visited various parts of North America. Indeed it seems pretty well established that during the tenth and eleventh centuries the Northmen discovered and visited a great part of the eastern coast of America. (*London Geog. Journal*, vol. 8.) The existence of Newfoundland however seems to have been forgotten until its re-discovery, on the 24th June, 1497, by John Cabot, then in the service of England. The name Newfoundland was given by Cabot to the whole of the territories discovered by him. The continent and other islands have since received other specific names, while that of Newfoundland has been confined to this island.

Cabot, on his return to England, having reported the great abundance of fish discovered on the coasts of Newfoundland, many private adventurers shortly after proceeded to the spot; and it appears that so early as the year 1500, 'the fishery was carried on by Portuguese, French, Biscayans, and other nations, on the banks or shallows, and on the coast to the east and south of the island of Newfoundland.' At that time the island contained great numbers of bears, beavers, otters, red foxes, martens, and hares, and a profitable trade was carried on with the Indians for the skins of these animals, which were shipped to Europe. No attempt was made to form a settlement on the island until 1536, when a London merchant, Mr. Hoare, attempted, together with the crew of his ship, to pass the winter there, but, after undergoing great hardships, they returned to England before the winter was over. The next attempt was made in 1583, when Sir Humfrey Gilbert, half-brother of Sir Walter Raleigh, having obtained from Queen Elizabeth a grant of 200 leagues round any point on the island where he might choose to settle, proceeded there with 200 people in five small vessels. He formed his settlement in the Bay of St. John, but some of his people became dissatisfied and returned to England, and the remainder having embarked with him on an exploring expedition to the south part of the island, more than 100 of them were lost in one of the ships in a storm. Upon this, with the rest of his followers, he was proceeding towards England, when another storm overtook them, and their vessel foundered. Several attempts to form settlements were afterwards made and successively abandoned, until in 1623 Sir George Calvert, afterwards Lord Baltimore, formed a colony in the south-eastern part of the island, which he called Avalon, and appointed his son the governor. The nature of Sir George Calvert's title does not appear. Soon after the formation of the colony, he proceeded thither, in order that he might freely enjoy the profession of the Roman Catholic religion. Ten years later, a colony was sent from Ireland by Lord Falkland, then lord-lieutenant of that part of the kingdom; and in 1654 Sir David Kirk went there with a few settlers, under the authority of a parliamentary grant. In the meanwhile the French had established a colony in Placentia Bay, and constant disputes arose between them and the English settlers. The permission of the French colony was confessedly a matter of favour on the part of the English government, to which the French fishermen for some time paid a tribute of five per cent. on the value of the fish taken. This payment was relinquished by Charles II. in 1675, and the French fishery thereupon increased rapidly. In the declaration of war against France issued by William III. shortly after he was called to the throne of England, it was stated as one cause of that measure, 'that it was not long since the French took licences from the governor of Newfoundland to fish upon that coast, and paid a tribute for such licences, as an acknowledgement of the sole right of the crown of England to that island; but of late, the encroachments of the French upon that island and his majesty's subjects, trade, and fishery there, had been more like the invasion of an enemy than becoming friends who enjoyed the advantages of that trade only by permission.'

During this war, and in that which followed, considerable damage was done by the French and English forces to the settlements of their respective countrymen on Newfoundland. In 1708 the French attacked and nearly destroyed the town of Saint John, and succeeded in obtaining possession of nearly every settlement; but at the treaty of Utrecht the island was declared to belong wholly to England, the French being allowed to fish under certain regulations, and to occupy the small islands of St. Pierre and Miquelon at the entrance of Placentia Bay, but a garrison of only 50 men was allowed to be kept in each. The subject of fishery rights on the shores and banks of Newfoundland has since been the cause of some disagreement between the English and French governments, and at this time (1839) is far from being placed on a satisfactory footing; but the sovereignty of the island as settled by the treaty of Utrecht has remained undisputed.

The population of Newfoundland has always been very fluctuating. The sole inducement to settlers is offered by the fisheries, for the prosecution of which many persons take up their abode on the island only during the fishing season, and leave it during the winter. By a census taken in 1763 it appeared that the number of inhabitants was then 13,112 of both sexes and all ages. The population in 1806 was estimated at 26,500. A census has since been taken in each of the years 1823, 1828, and 1836, showing the following results:—

	Males.	Females.	Total.
1823 . .	31,746	20,411	52,157
1828 . .	34,617	23,471	58,088
1836 . .	41,467	32,238	73,705

The population in the several districts in 1836 was as follows:—

Districts.	Males.	Females.	Total.
Saint John	10,239	8,687	18,926
Conception Bay . .	12,842	10,373	23,215
Trinity Bay	3,751	3,052	6,803
Bonavista Bay . . .	2,898	2,285	5,183
Fogo	2,131	1,366	3,497
Ferryland	3,330	1,781	5,111
Placentia and St. Mary	2,644	2,057	4,701
Burin	1,775	1,365	3,140
Fortune Bay . . .	1,857	1,272	3,129
Total	41,467	32,238	73,705

The produce of the fisheries at different periods will show the increasing importance of this colony. In 1763 there were taken and cured 386,274 quintals of codfish and 694 tierces of salmon. There were further exported 1598 tuns of train-oil, and furs to the value of about 2000*l.* In 1795 the fishery employed 400 sail of ships, of the aggregate burthen of 38,000 tons. The produce was 400,000 quintals of codfish, 3700 frails of salmon, 1000 barrels of herrings, 3300 tuns of cod and seal oil, and 4900 seal skins. There were also employed 2000 boats. In 1836 there were produced 860,354 quintals of codfish, 1534 barrels of herrings, 1847 tierces of salmon, 384,321 seal skins, and 9485 tuns of cod, seal, and whale oil, the value of the whole being 808,066*l.*

The inhabitants are in a great degree dependent for provisions upon importation. Salt provisions are sent from Ireland and Germany; large quantities of biscuit are also sent from Germany, flour is imported from the United States of America and from the north of Europe, and Indian corn meal from the United States. The agricultural return for 1836 states the number of acres in cultivation to be 11,062, and their produce 10,300 bushels of oats, 1,168,127 bushels of potatoes, and 6,975 tons of hay. The number of horses in that year was 1551, of horned cattle 5835, and of sheep 3103. The number of shipping that arrived at and departed from the colony in that year was as follows:—

	Inwards.		Outwards.	
Countries.	Ships.	Tons.	Ships.	Tons.
Great Britain .	186	26,646	145	18,546
British Colonies	323	29,718	376	42,144
United States .	39	5,720	18	2,157
Foreign States .	252	36,746	246	32,710
Total .	800	98,830	785	

The total value of imports in 1836 was 579,799*l.*, and of exports 787,099*l.*

(MacGregor's *British America*; Bouchette's *British Dominions in North America*; Chappell's *Voyage to Newfoundland*, 1818.)

NEWFOUNDLAND DOG, a well-known and fine variety of the dog, seldom seen in a state of purity, when it is comparatively small, but very muscular and strong, and generally black. The large, and, it must be confessed, handsome dogs, which are so often seen in this country, and pass for Newfoundland Dogs—"Dogs"—it is Col. Hawker, if we recollect right, who so designates them—'as big as a jackass and as hairy as a bear'—are very different from the compact and moderate-sized animals which, in their native country, are employed in drawing sledges and little carriages laden with wood, fish, or other commodities. Some of these true Newfoundland Dogs we have seen, and they make admirable retrievers. We have also seen the great and less pure *English* Newfoundland Dogs, so to speak, employed in the field for the same purpose with great success. One of the leading qualities of both, when so broken in, is the gallant manner in which they will face and penetrate cover, however thick and rough, in pursuit of the lost object. Whether it be furze, bramble, or blackthorn, in they dash, and almost always persevere till they have recovered the lost piece of game. As water-dogs they are above all praise. Their zeal, their devotedness, their entire abandonment of self when they rush to the rescue of some drowning wretch, are admirable; to be sure, in their eagerness to save, they sometimes encumber those with help who do not need it; and there have been instances where they have nearly destroyed the swimmer by their kindness. Directly they see anybody, or indeed any animal whatsoever, struggling in the water, in they jump, and seem to think that it is their duty never to leave them till they have got them out. They have been employed most successfully in wrecks, and will work against the most heavy sea; not always with success however. There is a case on record where the compact frame and indomitable courage of a bull-dog succeeded in carrying him through breakers which proved fatal to the Newfoundland breed. During a heavy gale a ship had struck on a rock near the land. The only chance of escape for the shipwrecked was to get a rope ashore, for it was impossible for any boat to live in the sea then running. There were two Newfoundland Dogs and a Bull-dog on board. One of the Newfoundland Dogs was thrown overboard with a rope tied round him, and perished in the waves. The second shared a similar fate; but the Bull-dog fought his way through that terrible sea; and arriving safe on shore, rope and all, became the saviour of the anxious people on the wreck.

The Newfoundland Dog is confiding, very sagacious, and capable of the warmest attachment to his master. The attacks of little dogs are generally either coolly looked down upon, as if hardly understood, or treated with marked contempt; but there are exceptions to this lofty behaviour: we saw a harmless and very affectionate pug receive his mortal hurt from one of these dogs, and that without the slightest provocation on the part of the poor little pug. This however was a bad-tempered exception to the general rule; and the Newfoundland Dog may, notwithstanding, be pronounced to be as generous as he is brave.

NEWHAVEN. [Sussex.]

NEWHAVEN. [Connecticut.]

NEWMARKET is a market-town, situated principally in the county of Suffolk, though some part, including the whole of the race-course, is in Cambridgeshire. Its direct distance from London is 55 miles north-north-east, and from the town of Cambridge 12 miles west. The main street is long and wide, well lighted, but only partially paved. There is a filthy watercourse running directly through the heart of the town. The houses for the most part are modern and well built. The greater part of the town was destroyed by fire in 1623, and again in the early part of the last century. The destruction of property on the former occasion was estimated at 20,000*l.* Horse-racing does not appear to have been introduced here till about the close of the sixteenth century, when some of the horses which had escaped from the wrecks of the Spanish Armada are said to have been exhibited here, and to have astonished the spectators by their extraordinary swiftness. Soon after the accession of James I. to the English throne horse-racing became a fashionable diversion, and a house was erected at Newmarket for the accommodation of him and his court. This house having been much injured during the civil war, in-

structions to rebuild it were given by Charles II., who was a distinguished patron of the turf. Part is still standing, the rest having been pulled down: adjoining are the extensive stables formerly used for the royal stud. The race-course is on the western side of the town. It extends four miles in length, and is considered the finest in the world. The prosperity of the place is mainly dependent upon the company which the races never fail to attract, and the training of horses, many of which are exported or otherwise disposed of at high prices. The training-ground is on a gentle acclivity on the southern side of the town, and for its purpose is even superior to the race-course, preference being given to it for training horses destined to run in the most distant parts of England. The weekly consumption of oats by the horses, which are here during the greater part of the year, is estimated at 500 quarters. The races which take place during the year are seven in number, namely, the Craven meeting, on Easter-Monday; the two Spring meetings, which follow with one week's interval between each; the July meeting; and the three meetings in October, the last of which is the Houghton. The accommodations afforded by the hotels, inns, and coffee-houses is of the first class. Three plates are annually given by the king, and one under very curious conditions by the will of a Mr. Perram. The market-day is Tuesday. The fairs are held on Whit-Tuesday and on the 8th of November.

Newmarket consists of two parishes, All Saints and St. Mary's. The former is in Cambridgeshire, and in 1831 its population was 714; the latter is in Suffolk, and its population in the same year was 2134: making a total of 2848 persons. The living of All Saints is a perpetual curacy of 37*l.* per annum; that of St. Mary is a rectory, consolidated with the vicarage of Wood Ditton, which are together valued at 373*l.*, and are in the gift of the duke of Rutland. Both are in the diocese of Norwich.

The sum of 25*l.* was formerly paid annually by the Exchequer to the parochial authorities, under a donation, as it is understood, of Queen Anne, for the support of charity-schools at Newmarket, but it was withdrawn about three years ago. After deducting 8*l.* 15*s.* for office-fees, the residue was equally divided between the master and mistress of the national school, who are appointed by the rector of St. Mary's, and whose duty it was to afford gratuitous instruction to 21 boys and the like number of girls. The school is now supported by voluntary contributions, and 72 boys and 53 girls are educated according to the principles of the established church; the number on Sunday being increased to 91 boys and 85 girls.

The other charities of Newmarket, which are numerous, though of small amount, are mentioned in the 'Twenty-second Report of the Charity Commissioners,' pp. 173-5.

(*Beauties of England; Population Returns.*)

NEWPORT. [MONMOUTHSHIRE; WIGHT, ISLE OF.]

NEWPORT PAGNELL, a market-town in the parish of Newport Pagnell, hundred of Newport, and county of Buckingham, 12 miles north-east by east from the town of Buckingham, and 45 miles north-west by north from London (direct distances). It is seated near the junction of the rivers Ouse and Ousel, by the latter of which it is divided into two unequal parts, and over which there is an elegant iron bridge, erected in 1810. The streets are ill paved, and only occasionally lighted with gas. The water for the use of the inhabitants, till within the last fifty years, was supplied by means of machinery from the Ouse, but is now derived from a town pump situate in the High-street. The parish church has lately undergone thorough repair. It is a spacious building of considerable antiquity, dedicated to St. Peter and St. Paul, and stands upon an eminence from which there is a fine view of the surrounding country. The living is a vicarage in the diocese of Lincoln, and in the gift of the crown, with a net annual income of 230*l.* There are in the town three other places of worship; the Independent Chapel was found by John Gibbs, who was ejected from the vicarage, and in which the Rev. Wm. Bull, the 'Delphic Oracle' of Cowper, preached for half a century. It is not a little singular that there are four private burial-grounds in this parish, only one of which is consecrated, namely, the one situated in the gardens of Tickford Abbey. The only manufacture of the town is that of bone lace, which, though not carried on to so great an extent as formerly, still forms a staple trade. There is a market every Saturday, and seven fairs are held in the year, four of which are supposed to have been chartered by Alfred the Great.

About the time of the Norman Conquest the manor of Newport was in the possession of William Fitzansculf, a powerful baron and ancestor of the Paganells, from whom the name Pagnell is derived. During the civil war the town was garrisoned by Prince Rupert, but was subsequently taken by the parliament, and retained by them during the remainder of the war. Sir Samuel Luke, conjectured to be the prototype of Hudibras, was its governor in the year 1645. (Lysons, i. 612.)

There are four schools, a national and a Lancasterian school, a girls', and an infant school, which are supported by voluntary donations. There is also a foundation for teaching twenty girls to read, write, and work, endowed by Dr. Atterbury with 10*l.* per annum; and a charity school for girls, supported by Mrs. Van Hagen. There is a Mechanics' Institution; and an academy, supported by the dissenters, for the education of young men for the Christian ministry. The principal charities of the place are Revis's almshouses and Queen Ann's hospital, so called from Ann, consort of James I., by whom it was refounded. The revenue of the former, 164*l.* per annum, is partly applied to the support and clothing of the seven aged persons appointed by the trustees to be the occupants of the almshouses, and partly towards defraying the expense of certain weekly stipends and distributions of bread, &c. The annual income of the hospital is 261*l.*, and is appropriated to the support of a master and six poor men and women, and an allowance of 20*l.* per annum to the vicar as master thereof.

The entire parish of Newport Pagnell, in the year 1831, contained a population of 3385 persons.

(Lysons' *Magna Britannia; Beauties of England and Wales; Twenty-seventh Report of the Commissioners on Charities*, pp. 148-175, &c.; *Communication from Newport Pagnell.*)

NEWRY, a town in Ireland, partly in the lordship of Newry in the county of Down, partly in the barony of Upper Orior, in the county of Armagh. It is on the Newry Water, which divides it into two parts, 38 English miles south-south-west of Belfast, and about 64 north of Dublin by Drogheda and Dundalk. The Newry Water flows into Carlingford Bay.

There was in antient times a monastery here, and a castle built by Sir John de Courcy, one of the early Anglo-Norman conquerors of Ulster; which castle was destroyed by the Scotch in their invasion of Ireland under Bruce. Being rebuilt, it was again destroyed in the rebellion of Shane O'Neal; but was a second time restored by Bagnal, Marshal of Ulster, who also rebuilt the town and repeopled it with Protestant settlers. Newry suffered in the civil war of 1641, and was destroyed by the army of James II. in their retreat from the north in 1689, only the castle and six houses being left standing.

The greater part of the town is on the eastern bank of the Newry Water in the county of Down, and is connected with the remaining part in the county of Armagh by several bridges over the Newry river or the Newry canal. The borough limits include a considerable rural district: there were, in 1831, 1992 houses, inhabited by 2566 families; the population was 13,065: the entire parish, which also extends into O'Neilland West barony in the county of Armagh, had a population of 25,117: nearly 400 men were employed in manufactures. The town is well built in the modern part, and is lighted with gas; it is increasing in wealth and extent. The main street consists of good houses: four of the bridges are of stone; there are spacious assembly-rooms; a neat and commodious custom-house; a church of Gothic architecture, built twenty years since at a cost of more than 12,000*l.*, with a tower and spire 190 feet high; a chapel-of-ease, formerly the parish church; two Catholic chapels, one of which is considered to be the diocesan chapel of the Catholic bishop of Dromore; a friary, which is also a seminary preparatory to the college of Maynooth; two Presbyterian meeting-houses, one of them large and elegant; some other dissenting places of worship; a barrack for 700 men; and an hospital capable of accommodating 30 or 40 patients.

There are at Newry iron-foundries on an extensive scale, and forges for making shovels, spades, and other iron goods; flint-glass and cordage are manufactured, and there are in and about the town a distillery and several flour or oatmeal mills. The trade of the town is great, and it has lately much increased, especially in the export of grain and the import of timber; it communicates with Carlingford Bay

five miles distant, by a ship canal, and with Lough Neagh by a boat canal, both parallel or nearly so to the river in that part of their course which is near the town. Lower down the ship canal opens into the river, by the bed of which it communicates with the bay; and the boat canal unites with the river Bann, by the bed of which it enters Lough Neagh. On the east side of the canal is a line of quays with warehouses; and northward from them is a dock for boats to take in or discharge their cargoes. The gross receipts of duties at the custom-house were in 1836 more than 58,000*l*. The chief trade of the port is with Great Britain. Irish produce, especially corn and cattle, and Irish manufactures, are sent to Liverpool and Glasgow; the imports are timber, coal from Lancashire and Scotland, tea, sugar, salt, British hardware, and other manufactured goods. The chief foreign trade is with the United States and British North America, the Mediterranean, Odessa, the Baltic, and Archangel. There is communication by steam-packets with Liverpool and Glasgow. The steam-boats do not go up to Newry, but to Warren Point, about six miles below, where also the larger trading vessels discharge their cargoes. A great number of labourers embark at Newry for the harvest in England, and few come back without 6*l*. or 7*l*. earned by their labour in England. There are markets on Tuesday, Thursday, and Saturday; the first is for grain, the last is for meat. There are two yearly fairs.

Newry was incorporated 10th James I. The corporation has however become extinct, but the town retained the privilege of returning two members to parliament up to the Union, when the number was reduced to one. It was, before the Reform Act, a scot and lot borough. The number of voters, 5*l*. (Irish) and 10*l*. householders, registered in 1832, 1833, and 1834, was 1156; but the former class of voters will be allowed to become extinct on the death or removal of those who at present possess the suffrage. The seneschal of the manor of Newry is the returning officer.

There is a manorial court held by the seneschal of the manor, having jurisdiction in suits under 100 marks. The quarter-sessions for the Newry division of the county of Down are held here twice in the year; quarter-sessions for the county of Armagh are also held twice in the year in that part of the town which is in Armagh county. Petty sessions are held weekly. The police force consists of detachments of the constabulary of the two counties. The parish of St. Mary, Newry, is a donative in the gift of the Earl of Kilmorey, who is impropriator of the tithes, and exercises (as lay abbot, or representative of the former abbots of a Cistercian abbey, which existed in the town prior to the Reformation), episcopal jurisdiction, holding ecclesiastical courts, and granting probates of wills and licences for marriage, subject only to the metropolitan jurisdiction of the archbishop of Armagh. The vicarage is endowed by the Earl of Kilmorey with 400*l*. per annum, but the net revenue is diminished to one half by the payment of curates' salaries. There is no glebe-house. The church and chapel-of-ease are attended by about 1000 to 1100 persons, chiefly in the morning. Three Catholic chapels in the parish are attended, chiefly in the afternoon, by about 3600 or 3700 persons; the various Presbyterian meeting-houses by nearly 2000 persons; and the other congregations by about 700 persons, chiefly in the evening. There are several schools, most of which are aided or supported by endowments or donations.

NEWSPAPERS. Some persons are of opinion that the origin of newspapers may be traced to the 'Acta Diurna' of the Romans. [ACTA DIURNA.] However this may be, it was not till the sixteenth century that anything at all approaching to the nature even of the 'Acta Diurna' existed in modern times. The war which the Republic of Venice waged against the Turks in Dalmatia gave rise, in 1563, to the custom in Venice of communicating military and commercial news by written sheets, which were read in a particular place to those desirous to hear them, and who paid for this privilege in a coin no longer in use, called *gazzetta*, a name which, by degrees, was transferred to the newspaper itself in Italy and France, and passed over into England. The Venetian government eventually gave these announcements in a regular manner once a month; but they were too jealous to allow them to be printed. Only a few written copies were transmitted to various places, and read to those who paid to hear. Many volumes of these manuscript newspapers exist in the Magliabecchian library at Florence.

It is to England, or rather to Lord Burghley, the able minister of Queen Elizabeth, that the honour of commencing printed sheets of public intelligence is now generally ascribed. The earliest of those which remain (copies are preserved among Dr. Birch's Historical Collections in the British Museum, No. 4106) relate to the descent of the Spanish Armada upon the English coasts; but as they are numbered 50, 51, and 54, in the corner of their upper margins, it has been not improbably concluded that a similar mode of publishing news had been resorted to considerably earlier than the date of that event, though, as far as we know, none of the papers have been preserved. 'The English Mercurie, published by authoritie for the contradiction of false reports,' was the title of these papers, and the last number contains an account of the queen's thanksgiving at St. Paul's for the victory she had gained over the enemies of England. It is probable that when the great alarm of the Armada had subsided, no more numbers were published. It must not however be concealed that doubt is entertained of the genuineness of these papers. Two of them are not of the time, but printed in modern type; and no originals are known: the third is in manuscript of the eighteenth century, altered and interpolated with changes in old language such only as an author would make.

From the time that 'The English Mercurie' (if genuine) was given up, we find no continued vehicle for political intelligence with a fixed title in England for many years. In the reign of James I., packets of news were published in the shape of small quarto pamphlets occasionally. The earliest we have met with, preserved in the second volume of the series of newspapers purchased with Dr. Burney's library (also in the British Museum), is entitled 'News out of Holland,' published in 1619 for N. Newbery, followed by other papers of news from different countries in 1620, 1621, and 1622. There can be no doubt of the genuineness of these. In 1622, when the Thirty Years' War and the exploits of Gustavus Adolphus excited curiosity, these occasional pamphlets were converted into a regular weekly publication, entitled 'The News of the Present Week,' edited by Nathaniel Butler. This seems to have been the first weekly newspaper in England.*

About this period newspapers began also to be established on the Continent. Their originator at Paris is said to have been one Renaudot, a physician, who had found that it was conducive to success in his profession to be able to tell his patients the news. Seasons were not always sickly, but his taste for collecting news was always the same, and he began to think that there might be some advantage in printing his intelligence periodically. His scheme succeeded, and he obtained a privilege for publishing news in 1632. It would appear that not long after this time there were more newspapers than one in England.

Upon the breaking out of the civil war in Charles the First's time, great numbers of newspapers, which had hitherto been chiefly confined to foreign intelligence, were spread abroad by the different parties into which the state was then divided, under the titles of 'Diurnals,' 'Special Passages,' 'Intelligencers,' 'Mercuries,' &c., mostly in the size of small quarto, and treating of domestic matters. Nearly a score are said to have come out in 1643, when the war was at its height. Heylin, in the address prefixed to his 'Cosmographie,' enjoins the reader not to think himself unsatisfied in his expectation, if he find not in it 'the situation and affairs of each town of war or the quartering-place of every company or troop of soldiers, which are presented to him in the weekly news-books.' Hence we find some papers entitled 'News from Hull,' 'News from the North,' 'The Last-printed News from Chichester, Windsor, Winchester, Chester,' &c., and others too numerous to mention. We also find 'The Scots Dove' opposed to 'The Parliament Kite,' or 'The Secret Owl.' Keener animosities, as D'Israeli remarks, produced keener titles: 'Heraclitus Ridens' was met by 'Democritus Ridens,' and 'The Weekly Discoverer' was shortly met by 'The Discoverer Stript Naked.' 'Mercurius Britannicus' was grappled by 'Mercurius Mastix faithfully lashing all Scouts, Mercuries, Posts, Spies, and others.' Mercurius was the favourite name, with another word to indicate the character of the party from which it emanated. Whenever any title however grew popular, it was stolen by the antagonist, who

* Before the introduction of printed newspapers, it appears that great families had a sort of gazetteers in London, who transmitted to them the news of the day in written letters. This custom accounts for the following memorandum preserved in the Clifford family: 'To Captain Robinson, by my lord's commands, for writing letters of news to his lordship for half a year, five pounds.' (Whitaker's *Hist. of Craven*.)

thus conveyed his opinions to those who would not have received them had he not worn the appearance of a friend.

D'Israeli, in his 'Curiosities of Literature,' gives an account of the two principal persons who were at this time concerned in the newspaper press, Marchant Needham and Sir John Berkenhout. 'Marchant Needham,' he says, 'the great patriarch of newspaper writers, was a man of versatile talents and more versatile politics, a bold adventurer, and most successful because the most profligate of his tribe. From college he came to London; was an usher in Merchant Taylors' school; then an under-clerk in Gray's Inn; at length studied physic and practised chemistry; and finally he was a captain, and, in the words of honest Antony à Wood, 'siding with the rout and scum of the people, he made them weekly sport by railing at all that was noble in his intelligence, called Mercurius Britannicus, wherein his endeavours were to sacrifice the fame of some lord, or any person of quality, and of the king himself, to the beast with many heads.' He soon became popular, and was known under the name of Captain Needham of Gray's Inn; and whatever he now wrote was deemed oracular. But whether from a slight imprisonment for aspersing Charles I., or some pique with his own party, he requested an audience on his knees with the king, reconciled himself to his majesty, and showed himself a violent royalist in his 'Mercurius Pragmaticus,' and galled the Presbyterians with his wit and quips. Some time after, when the popular party prevailed, he was still further enlightened, and was got over by President Bradshaw as easily as by Charles I. Our Mercurial writer became once more a virulent Presbyterian, and lashed the royalists outrageously in his 'Mercurius Politicus:' at length, on the return of Charles II., being now conscious, says our friend Antony, that he might be in danger of the halter, once more he is said to have fled into Holland, waiting for an act of oblivion. For money given to a hungry courtier, Needham obtained his pardon under the great seal. He latterly practised as a physician among his party, but lived universally hated by the royalists, and now only committed harmless treasons with the College of Physicians, on whom he poured all that gall and vinegar which the government had suppressed from flowing through its natural channel.' In buffoonery, keenness, and boldness, Sir John Berkenhout, the other principal news-writer of the day, was not inferior, nor was he at times less an adventurer than Needham. His 'Mercurius Aulicus' was devoted to the court, then at Oxford. Beside newspapers, he was the author of numerous small political pamphlets abounding in wit and satire.

In 1662 the 'Kingdom's Intelligencer' was commenced in London, which contained a greater variety of useful information than any of its predecessors. It had a sort of obituary, notices of proceedings in parliament and in the law courts, &c. Some curious advertisements also appear in its columns. In 1663 another paper, called 'The Intelligencer, published for the satisfaction and information of the people,' was started by Roger (afterwards Sir Roger) L'Estrange, who warmly espoused the cause of the crown on all occasions, and infused into his newspapers more information, more entertainment, and more advertisements of importance than were contained in any succeeding paper whatever previous to the reign of Anne. L'Estrange continued his journal for two years, but dropped it upon the appearance of the 'London Gazette,' first called the 'Oxford Gazette,' owing to the earlier numbers being issued at Oxford, where the court was then holding and the parliament sitting, on account of the plague being in London. The first number of what has still continued to the present time, as the 'London Gazette,' was published at Oxford, February 4th, 1665. So numerous did these little *books of news*, as they were called, become at this time, that between the years 1661 and 1668 no less than seventy of them were published under various titles.

On the 12th of May, 1680, L'Estrange, who had then started a second paper, called the 'Observator,' first exercised his authority as licenser of the press, by procuring to be issued a 'proclamation for suppressing the printing and publishing unlicensed news-books and pamphlets of news, because it has become a common practice for evil disposed persons to vend to his majesty's people all the idle and malicious reports that they could collect or invent, contrary to law; the continuance whereof would in a short time endanger the peace of the kingdom; the same manifestly tending thereto, as has been declared by all his majesty's subjects unanimously.' The charge for inserting advertisements (then untaxed) at this period, we learn from the *Jockey's Intelligencer*, 1683, to be 'a shilling for a horse or coach, for notification, and sixpence for renewing;' also in the 'Observator Reformed' it is announced that advertisements of eight lines are inserted for one shilling; and Morphew's 'Country Gentleman's Courant,' two years afterwards, says, that 'seeing promotion of trade is a matter that ought to be encouraged, the price of advertisements is advanced to two pence per line.' The publishers at this time however were sometimes puzzled for news to fill their sheets, small as they were; but a few of them got over the difficulty in a sufficiently ingenious manner. The 'Flying Post,' in 1695, announces, that 'if any gentleman has a mind to oblige his country friend or correspondent with this account of public affairs, he may have it for two-pence of J. Salisbury, at the Rising Sun in Cornhill, on a sheet of fine paper, *half of which being blank*, he may thereon write his own private business, or the material news of the day.' Again, 'Dawker's News-Letter:' 'This Letter will be done upon good writing-paper, and blank space left, that any gentleman may write his own private business. It will be useful to improve the younger sort in writing a curious hand.' Another publisher had recourse to an expedient for filling his sheet, curious enough; wherever there was a dearth of news, he filled up the blank part with a sufficient proportion from the Bible.

It was not until the reign of Anne that the Londoners enjoyed the luxury of a newspaper every day. The first was issued in 1709, and called 'The Daily Courant,' being published every day but Sunday. There were at this time seventeen others published thrice a week, and one twice. Among them was the 'British Apollo,' the 'General Postscript,' the 'London Gazette,' the 'Postman,' the 'Evening Post,' and the 'City Intelligencer.'

It was about this time that a new species of publication came out, which, although it would scarcely be regarded as belonging to the family of newspapers now, was held to be so then; and in fact, for a considerable time after it was commenced, it included articles of news along with its other matter. We allude to those admirable publications, the 'Tatler,' 'Spectator,' 'Guardian,' &c., which formed the models of so many subsequent publications of the same kind. The first number of the 'Tatler' was published on the 23rd of April, new style, 1709; the last on the 2nd of January, 1711. Much space was occupied in each by advertisements, and the price of each number was a penny. The publication of the 'Spectator' began March 1, 1711, at the same price; but upon the imposition of the halfpenny stamp-duty, which began August 1, 1712, the price was raised to two-pence. The halfpenny tax is conjectured to have been the cause of the 'Spectator' being stopped in the beginning of 1713. It was however immediately followed by the 'Guardian,' the first number of which appeared on March 2nd, 1713. This paper soon dropped, and was succeeded by the 'Englishman' in October the same year (professedly political). The 'Englishman' lasted for two years, and was in its turn supplanted by the 'Freeholder,' on December 23rd, 1715; the latter work being almost the sole production of Addison.

It may be sufficient to notice in few words two or three of the more remarkable journals only which have since succeeded. The 'Public Advertiser' was first printed under the title of the 'London Daily Post and General Advertiser,' so far back as 1726, and assumed its later name only in 1752. This paper was the vehicle through which 'Junius's Letters' were given to the world. The 'St. James's Chronicle' is another of our oldest papers; at its first publication it was an amalgamation of two papers (the 'St. James's Post' and the 'St. James's Evening Post'), both of which begun in 1715. The 'North Briton,' edited by Wilkes, first appeared in 1762; and in the same year the 'Englishman' was established. The 'Englishman' attracted much notice about 1766, on account of the insertion of several satirical articles in it by Burke.

The following account of the origin of the newspaper stamp is given by Cooke, in his 'Life of Bolingbroke.' 'Queen Anne, in one of her messages to parliament, declared that, by seditious papers and factious rumours, designing men had been able to sink credit, and that the innocent had suffered; and she recommended the House to find a remedy equal to the mischief. In obedience to the Queen's desire, and at the instance of her secretary, the

parliament passed a bill, in 1712, imposing a stamp duty upon pamphlets and publications. At its origin the amount of this stamp was a halfpenny; and it is curious to observe what an effect this trifling impost had upon the circulation of the most favourite papers. Many were entirely discontinued, and several of those which survived were generally united into one publication.' The act which imposed this duty is 10 Anne, c. xix. It is to this act that Swift alludes in his Journal to Stella, under August 7, 1712: 'Do you know that all Grub Street is dead and gone last week?'

By the 6th and 7th Wm. IV., c. 76, the stamp-duty on newspapers, which had been gradually raised to 4*d.* (with a discount of 20 per cent.), was reduced to 1*d.* (without any discount), a discount of 25 per cent. being allowed for Ireland. The quantity of letter-press on a sheet of paper bearing a stamp of 1*d.* is limited to 1530 square inches on one side. If it exceeds 1530 square inches, but does not exceed 2295, the stamp is 1½*d.*; above 2295, it is 2*d.* A supplement not exceeding 765 square inches of print on one side published with any newspaper, is chargeable with a duty of ½*d.* The title of every newspaper is now printed on its stamp, it having been found that in the returns the stamps entered as used by one paper were frequently used by another; and the stamp returns may now be relied upon as showing the actual circulation of each newspaper.

In 1836, when the stamp-duty was 4*d.*, the total number of stamps issued for the United Kingdom was 35,576,000.

In 1838 the total number of 1*d.* stamps issued was, in round numbers, as follows:—

London	28,500,000
English provincial papers . .	15,500,000
Welsh papers	350,000
England and Wales . . .	44,350,000
Scotland	5,117,000
Ireland	5,225,000
Total . .	54,692,000

From the 5th July, 1833, the duty on advertisements was reduced from 3*s.* 6*d.* to 1*s.* 6*d.* in Great Britain, and to 1*s.* in Ireland. The following statement of the total number of advertisements, and total amount received therefrom, will show the results of this reduction:—

	England and Wales.		Ireland.		Scotland.	
	Advts.	Duty.	Advts.	Duty.	Advts.	Duty.
Year.	No.	£.	No.	£.	No.	£.
1832	783,567	137,122	121,991	15,248	104,447	18,278
1838	1,315,580	98,668	178,200	8,910	176,411	13,230

The London newspapers are now divided into three classes: the daily, the twice or thrice a week, and the weekly; the daily are again divided into morning and evening papers. The expense attending the establishing and carrying on of a London daily newspaper is very great. To establish a morning paper requires a capital of from 50,000*l.* to 60,000*l.*; and the risk is so great that a single individual would hardly venture on such a speculation. It is assumed that capital to the amount of 500,000*l.* at least is invested in the daily press of London, of which two-thirds, or nearly so, may be represented by the morning papers.

Previous to the reduction of the newspaper stamp-duty at the end of 1836, the general price of the London daily papers was 7*d.*: it is now 5*d.* Previous to the reduction of the advertisement duty in July, 1833, the lowest price of an advertisement in a London daily paper was 7*s.*: it is now 5*s.*

The 'Times,' the largest of the London newspapers, since the reduction of the newspaper stamp-duty at the end of 1836 has issued daily a double paper, that is, eight pages of six columns each. The printed area of the whole paper (both sides) is more than 19½ square feet, or a space of nearly 5 feet by 4. On a rough estimate it contains about 113,000 words, which is equal to about 70 pages of the 'Penny Cyclopædia.' Compared with an 8vo. volume having a page of print of 3½ by 6¼ inches, the area of the 'Times' is equal to more than 120 of the 8vo. pages; and, allowing for difference of size in the type, to perhaps 200 of the printed 8vo. pages.

The 'Times' is printed by a machine worked by steam-power, which is capable of printing 2500 in an hour *perfect*, that is, on both sides; so that an impression of 12,500 can be completed in five hours. The paper is generally put to press at five in the morning, at half-past six publication commences, and at ten the whole impression is ready to be issued to the public. Mr. Babbage, after describing the manner in which eight and forty columns are formed into eight pages and placed on the platform of the printing-machine, says, 'Ink is rapidly supplied to the moving types by the most perfect mechanism: four attendants incessantly introduce the edges of large sheets of white paper to the junction of two great rollers, which seem to devour them with unsated appetite; other rollers convey them to the type already inked, and having brought them into rapid and successive contact, redeliver them to four other assistants, completely printed by the almost momentary touch.'

Fifteen or sixteen gentlemen are employed by the 'Times' for the purpose of reporting the debates in parliament, others are engaged to report the trials in the courts of law, and examinations and convictions before police magistrates, and to furnish accounts of all public meetings of any interest or importance both in London and in the provinces. To show the manner in which the parliamentary proceedings are reported, let us suppose that an important debate is expected in each house of parliament, and that four reporters are engaged for the Lords and four for the Commons, the process of reporting being the same in each house. The first reporter takes notes for an hour, before the end of which time the second reporter is by his side and ready to succeed him. The first then hastens to the 'Times' office to write out his notes at length for the compositors; the second remains for an hour, and then hurries away like the former, while the third is taking notes for another hour, and he is followed in the same manner by the fourth. The first reporter is now ready to succeed the fourth; he takes notes for an hour, and is followed by the second, and so on till the house breaks up. The time of taking notes is frequently limited to three-quarters of an hour or even less. By this process the whole of a series of debates which began at four or five in the afternoon and continued till three or four in the morning, is issued to the public within a few hours of the time when the debate terminated. Reporters on all turns after the first are allowed cab or coach hire. The distance between the houses of parliament and the printing-office has been calculated to cost the newspapers about two reporters each; that is, the time occupied in going backwards and forwards is equal to the employment of two reporters on each paper. Short-hand is not much used in parliamentary reporting; indeed some of the best reporters never use it, the notes being used rather as an assistance to the memory in giving an abstract of the speeches than in reporting them as they were spoken. All the other London daily papers have an establishment of reporters similar to that of the 'Times,' but on a somewhat smaller scale, and extra reporters are engaged during the session of parliament.

The lowest price charged for an advertisement in the 'Times' is 5*s.*, with the exception of servants wanting places, which are only 4*s.* If it exceeds four lines, 6*d.* is charged for every additional line till it reaches the length of about 20 lines. When it exceeds this length, the rate of charge is increased, the longest advertisements being charged at the highest rate.

One hundred persons at least are employed on the establishment of the 'Times.' There are three editors, fifteen or sixteen reporters, at a very liberal annual salary, three or four readers, three or four clerks, twelve attendants on the machinery, about fifty compositors, besides foreign correspondents, news-collectors, and agents.

We subjoin a list of the London newspapers, showing the sale of each publication and the number of advertisements contained in it, formed on an average of the whole of the year 1838, and drawn from accounts furnished by the Stamp-office, and printed by order of the House of Commons:—

LONDON NEWSPAPERS.

Daily Morning.

	Sale.	Advertisements.
Morning Advertiser . . .	5,000	164
Morning Chronicle . . .	6,630	197
Morning Herald . . .	6,150	204
Morning Post . . .	2,800	136
Times . . .	11,660	478
Public Ledger . . .	334	46
	32,574	1225

Daily Evening.	Sale.	Adverts.
Courier	1,273	40
Globe	2,940	50
Standard	3,435	52
Sun	4,294	40
Shipping Gazette	1,014	29
	12,956	211
Three Times a Week.		
English Chronicle	808	3
Evening Chronicle	1,513	6
Evening Mail	1,760	5
St. James's Chronicle	4,536	31
	8,617	45
Twice a Week.		
London Gazette	1,538	66
Patriot	2,293	34
Record	2,910	70
	6,741	170
Weekly.		
Age	2,317	72
Atlas	2,692	62
Bell's Weekly Messenger	17,274	80
Bell's New Weekly Messenger	3,116	36
Bell's Life in London	20,000	49
Champion and Weekly Herald	575	3
County Chronicle	1,567	53
County Herald	894	27
Court Journal	1,663	65
Court Gazette	1,577	13
Era	2,442	10
Essex, Herts, and Kent Mercury	1,277	35
Examiner	5,153	80
Gardener's Gazette	2,711	32
John Bull	4,346	115
London Dispatch	4,980	33
Magnet	4,317	10
Mark Lane Express	3,476	45
Metropolitan Conservative Journal	2,182	35
Mining Journal	1,365	38
Naval and Military Gazette	1,474	64
News	1,942	60
Observer	5,288	95
Planet	4,692	7
Railway Times	1,786	25
Satirist	2,971	86
Spectator	3,038	61
Sunday Times	13,365	114
United Service Gazette	1,457	62
Watchman	2,637	43
Weekly Chronicle	32,327	93
Weekly Dispatch	51,570	138
Weekly True Sun	6,336	64
	212,807	1,805

6 daily morning	total	32,574	1,225
5 daily evening	do.	12,956	211
4 three times a week	do.	8,617	45
3 twice a week	do.	6,741	170
33 weekly		212,807	1805
	Total	273,695	3,456

Besides these there are a few weekly journals of a purely literary character, the princial of which are the *Athenæum* and the *Literary Gazette*.

The four papers which are published three times a week are made up from the columns of four of the daily papers, the advertisements being omitted and a selection made of the most interesting matter. The *English Chronicle* belongs to the *Morning Herald;* the *Evening Chronicle* to the *Morning Chronicle;* the *Evening Mail* to the *Times;* and the *St. James's Chronicle* to the *Standard.*

The earliest local provincial newspaper in England is said to have been the 'Norwich Postman,' published in 1706, at the charge of a penny, but 'a halfpenny not refused;' followed by the 'Norwich Courant, or Weekly Packet,' in 1714, price three half-pence. Previous to 1720 the 'York Mercury' appeared, followed in that year by the 'York Courant,' which still exists. In this year also a 'Leeds Mercury' was established; and about the same time a 'Gloucester Journal.' In 1730 a 'Manchester Gazette' was published. The 'Oxford Journal' began in 1740; a 'Preston Journal' in 1745, and 'Billinge's Liverpool Advertiser' in 1765.

In the year 1838 the total number of English provincial newspapers was 240, and of Welsh 10, with a sale of about 15,500,000 for the whole year. They are all weekly papers, with the exception of two or three, which are published twice and three times a week. Some of them are very large, and have an extensive circulation and a great number of advertisements. The 'Leeds Mercury,' for instance, is as large as the 'Times,' has a weekly sale of 9000, and an average weekly number of 245 advertisements. The 'Liverpool Mercury' has a weekly sale of 6400, and averages about 280 advertisements.

In Scotland the newspaper-press was first introduced during the civil wars in the seventeenth century. When a party of Cromwell's troops arrived at Leith in 1652, for the purpose of garrisoning the citadel, they brought a printer, named Christopher Higgins, to reprint a London diurnal, called 'Mercurius Politicus,' for their amusement and information. The first number was issued on the 26th October, 1653; and in November the following year, the establishment was transferred to Edinburgh, where this reprinting system was continued till the 11th April, 1660. On the 31st December, 1660, appeared at Edinburgh 'The Mercurius Caledonius,' purporting to comprise 'the affairs in agitation in Scotland, with a survey of foreign intelligence.' It was a small quarto of eight pages. The last number was dated March 22 to March 28, 1661. It was succeeded by 'The Kingdom's Intelligencer.' In 1669 an 'Edinburgh Gazette' was published by authority, followed in 1705 by the 'Edinburgh Courant.' 'The Caledonian Mercury,' which still exists, was first published on April 28, 1720. After Edinburgh, the next place at which the publication of a newspaper was attempted in Scotland was Glasgow, where the first number of the 'Glasgow Courant' appeared November 11, 1715. 'The Glasgow Journal,' begun in 1729, still exists. An 'Aberdeen Journal, or North British Magazine,' began in 1746; the first number gave an account of the battle of Culloden; this paper still continues. The 'Dumfries Journal' commenced in 1750. The 'Kelso Mail' was established in 1797; the 'Dundee Courier,' in 1800; the 'Dundee Advertiser,' 1801; followed by the 'Dundee Chronicle;' the 'Ayr Advertiser,' and the 'Greenock Advertiser,' in 1802; an 'Inverness Journal,' in 1807; and the 'Perth Advertiser,' in 1808; in 1811 the 'Montrose, Arbroath, and Brechin Review' was established. Somewhat subsequent to this the 'Fife Herald' was established, and in 1833, the 'Fifeshire Journal.' In 1820 a 'Stirling Journal' was instituted, followed by a 'Stirling Advertiser,' but both have been since united in one paper. Scotland has also three other country newspapers, viz. the 'Elgin Courier,' the 'Paisley Advertiser,' and the 'Western Independent.' In 1838 there were 64 newspapers circulated in Scotland, of which 16 belonged to Edinburgh. There were no daily papers. The total sale was 5,117,000.

In Ireland, as in England and Scotland, newspaper intelligence originated during civil commotion. As far back as 1641, at the breaking out of the Rebellion of that year, there was printed a news sheet called 'Warranted Tidings from Ireland;' but from that time to the beginning of the eighteenth century, we have no notice of any other print of the kind, although it is not improbable that there may have been some. About the year 1700, a newspaper called 'Pue's Occurrences,' named after the proprietor, was established in Dublin, and maintained itself for more than half a century. This was the first newspaper published in the Irish capital. The next Dublin print was 'Falkener's Journal,' established in 1728—both were daily papers. Waterford appears to have followed Dublin in publishing news, by the establishment of a paper in 1729, entitled 'The Waterford Flying Post.' In November, 1766, the 'Waterford Journal' came out; and 'Ramsay's 'Waterford Chronicle' about the same time. The present 'Waterford Mirror' was started in 1801. The oldest existing newspaper in Ireland is the 'Belfast News Letter,' started in 1737. Among the other existing Dublin papers may be mentioned the 'Evening Post,' which has now existed about sixty years. In 1838 there were 84 newspapers circulated in Ireland, of

which 26 belonged to Dublin. The total sale was 5,225,000. There are five daily papers in Dublin.

The newspapers of Great Britain have much improved within the last twenty or thirty years. Before that time, few of them contained any original articles or essays beyond occasional or local paragraphs. But all the English newspapers are still too exclusively devoted to the support of some particular political party, or to some particular object; and it is not easy to find in any one of them a full and impartial discussion of any great question affecting the general interest, free from party bias and direct abuse or oblique censure of individuals whose views differ from those of the newspaper writer. In the comprehensiveness of their views, their just estimation of the value of general principles, and in their sober and critical application of them to the solution of political questions which affect the interest of the community, the best French newspapers have a decided superiority over the English. Some of the French provincial newspapers occasionally contain articles which deserve to find a place among a collection of political essays.

Newspapers are now as common in the British dominions abroad as in England; and in British India six gazettes are published in the Bengal language. In Van-Diemen's Land no fewer than six papers are published at Hobart's Town, namely, the 'Hobart Town Gazette,' the 'Hobart Town Courier,' 'True Colonist,' the 'Tasmanian and Austral-Asiatic Review,' 'Colonial Times,' and 'Bent's News and Tasmanian Threepenny Register;' and two at Launceston, the 'Cornwall Chronicle' and the 'Launceston Advertiser.' In New South Wales there are five newspapers, published at Sidney. At Perth in Western Australia there is now a weekly paper. The 'South Australian Gazette' is published at Adelaide; the first number was printed in England, and carried out, with printing materials, to Australia. It has been followed by another, the 'South Australian:' and a newspaper has been commenced this year (1839) at Port Lincoln. Two newspapers have also been commenced within the present year at Melbourne, in the newly-explored territory of Australia Felix. The first New Zealand Colony, which sailed in September, 1839, carried out the materials for printing a newspaper, of which the first number was printed in England.

In Germany newspapers originated in the 'Relations,' as they were termed, which sprung up at Augsburg and Vienna in 1524, at Ratisbon in 1528, at Dillingen in 1569, and at Nürnberg in 1571, and which appeared in the form of letters printed, but without date, place, or number. The first German newspaper in numbered sheets was printed in 1612. Of the Italian journals, the 'Gazzetta di Milano,' 'Gazzetta di Venezia,' and 'Giornale del Regno delle due Sicilie' are daily; the 'Diario di Roma,' 'Gazzetta di Firenze,' 'Giornale di Commercio di Livorno,' 'Gazzetta di Bologna,' 'Gazzetta Piemontese,' 'Gazzetta di Genova,' 'Voce della Verita' of Modena, 'Gazzetta di Parma,' 'Gazzetta di Lucca,' 'Osservatore Veneziano,' and some others, appear two or three times a week, and a much greater number weekly. The whole number of journals in Italy, including all periodicals, political, literary, and scientific, exceeds two hundred. Madrid has its 'Gaceta;' and Lisbon has also a paper for the publication of official documents and communications. In Belgium and Holland there are, in French and Dutch respectively, a considerable number of daily and weekly papers. In 1830 Switzerland had twenty-four weekly papers, and five others which appeared once a fortnight: the number is since increased. Most of them are written in German. Some are in French, one or two in Italian, and one in the Romansh or Grisons language. The first Russian paper was published in 1703, under Peter I. In 1829 the number of papers and periodicals published in the Russian empire was seventy-three; but the only important political journals are the 'Gazette de St. Petersburg' and the 'Journal de St. Petersburg.' In Sweden the newspapers are not much devoted to political discussion. Denmark has about eighty journals, of which twenty-three are devoted to politics and twenty-five to the sciences. The Greeks have several newspapers in their own language. A journal is published at Corfu, one at Athens, and another at Smyrna. The 'Moniteur Ottoman' is published at Constantinople, in French, under the sanction of the sultan, and the viceroy of Egypt has his official paper printed in the same language, at Boulak near Cairo.

In the United States the increase of newspapers has been more rapid than in England. In the year 1704, the first Anglo-American newspaper, called the 'Boston News Letter,' was published at Boston. In 1719 the first newspaper was published in Pennsylvania; and in 1733 the first newspapers were published in New York and Rhode Island. Now there is hardly a petty town in any of the twenty-six states without its newspaper, and in the large cities, such as New York, several are published daily. In Pennsylvania a considerable number of newspapers are printed in the German language and distributed among the numerous German settlers in that state. One German newspaper at least is also published in Maryland, and perhaps more. In Louisiana, some papers are printed both in French and English.

The largest collection of newspapers in England is in the British Museum. This collection was commenced by a considerable number being sent there, at the time when the Museum was established, with the library of Sir Hans Sloane. Another collection, of itself valued at 1000*l.*, was purchased in 1813 with the library of the late Dr. Charles Burney. At the end of two years from the time of publication the commissioners of stamps now transfer to the British Museum, for public use, copies of all the stamped newspapers, both of town and country.

The newspapers of 1837 delivered to the British Museum from the Stamp-office were, London papers 89, country papers 201, British Islands 15, Scotch papers 52, Irish 67.

(Chalmers's *Life of Ruddiman*, 8vo., London, 1794, pp. 106-124, with his Appendix, No. 6, pp. 404-441; Nichols's *Literary Anecdotes of the Eighteenth Century*, vol. i., p. 312; vol. iv., pp. 33-97; vol. viii., pp. 495-499; *Encyclopædia Americana*, vol. ix., 8vo., Philad., 1832, pp. 253-263; Chambers's *Edinburgh Journal*, vol. iii., fol., London, 1835, articles in pp. 113, 130, 146, 193, 242, 306, 322, 389; see also various articles in the *Companion to the Newspaper*, fol., 1833-1836.)

NEWTON, ISAAC, was born 25th December, 1642, old style, at Woolsthorpe, a hamlet in the parish of Colsterworth and county of Lincoln, eight miles south of Grantham. From the pedigree registered upon oath in the Herald's office, by Newton himself, in the year 1705, it appears that he was descended from a family of that name, which was resident at Westby in Lincolnshire until about the year 1370 ('Biog. Brit.'), when it became possessed of the manor of Woolsthorpe. His father, Isaac Newton, married the daughter of James Ayscough of Market Overton in Rutlandshire, and the subject of this article was their only child. The mother was left a widow during her pregnancy, and appears to have given premature birth to her child, which was of extremely diminutive size. Mrs. Newton, whose income was little more than 80*l.* per annum, soon contracted a second marriage with the Rev. Barnabas Smith, rector of North Witham, whereupon young Isaac, then about three years old, was confided to the care of his maternal grandmother, by whom he was sent to two day-schools at Skillington and Stoke, until he attained the age of twelve years, when he was admitted into the free grammar-school of Grantham. While here he evinced considerable aptitude for mechanical contrivances, and among other things he constructed a windmill and water-clock, but in the prosecution of his regular scholastic studies he for some time took little interest, and accordingly stood very low in the school. At length however 'the boy who was above him, having one day given him a severe kick upon the stomach, from which he suffered great pain, Isaac laboured incessantly till he got above him in the school, and from that time he continued to rise until he was the head boy.' (Brewster's *Life*.) The decease of Mrs. Newton's second husband, in 1656, induced her to return to the manor of Woolsthorpe, and in that year Isaac was taken from school to assist in the management of the farm. Accordingly on market-days he was sent to Grantham, accompanied by an aged domestic, either to dispose of farm produce, or to purchase such things as were needed by the family. But on these occasions it more frequently happened that Isaac stopped by the way-side, watching the motions of a water-wheel or some other piece of machinery, or if he reached the town of Grantham it was only to resort to the apothecary's garret in which he had resided while he attended the grammar-school, and where a few old books afforded him ample entertainment until his trusty companion summoned him to return home. These and other instances having shown the inutility of thwarting his studious disposition he was shortly after sent back to Grantham school. How

long he remained at school this second time does not appear, but when he had attained his seventeenth year it was determined to send him to Trinity College, Cambridge, at the recommendation of his uncle, the Rev. W. Ayscough, who had been himself educated there. His matriculation took place 5th June, 1660, the year in which Dr. Barrow was appointed to the Greek professorship.

It is a matter of regret that no definite information exists as to the order in which Newton pursued his mathematical studies before entering the university. Biot gives an unauthenticated although very probable anecdote to the effect that while Newton was yet a lad 'one of his uncles found him beneath a hedge, wholly absorbed in the solution of a mathematical problem;' but we find no mention of any mathematical work which had occupied his attention, with the exception of the 'Elements' of Euclid. It has been asserted that a glance at the fundamental propositions was immediately followed by a knowledge of the numerous consequences which may thence be deduced. But the fame of Newton is not enhanced by stating as true what is in the highest degree improbable. There is no doubt that he had read the 'Elements,' though not perhaps with that attention which he afterwards acknowledged their importance deserved. As to his knowledge of natural philosophy, his water-clock, windmill, and sundials may be considered as evidence of his early acquaintance with the principles of mechanics and with the doctrine of the sphere, for it is difficult to suppose that a mind such as his, so ardent in the pursuit of truth, could have contented itself with following a few rules of authority without understanding the reasons upon which they were based. But if these considerations be not thought conclusive, we have only to look to the nature of his discoveries during the first six years of his residence at Cambridge, that is, before the completion of his twenty-fourth year, in order to be convinced that he must either have pushed his studies to a very considerable extent before entering the university, or that his subsequent progress was perfectly unparalleled; for in this period of six years he invented his Binomial Theorem, established the fundamental principles of his doctrine of Fluxions, and demonstrated the law of the force in virtue of which the planets gravitate towards the sun, although, in consequence of the erroneous measurement of the earth then in use, it was not till afterwards that he was able to show that the same law holds with respect to the moon, and that the force manifested at the earth's surface in the fall of a pebble is identical, as to its nature, with that which pervades the whole planetary system.

Descartes had already laid open a vast field of research by the successful application of algebra to geometry, and his writings, both mathematical and speculative, were then much read at Cambridge. After the perusal of Saunderson's 'Logic' and the 'Optics' of Kepler, the attention of Newton was directed to the 'Geometria' of Descartes, a work which, doubtless, exercised considerable influence over his subsequent pursuits, by furnishing him with general methods of direct investigation, such as, till the time of Descartes, were totally unknown. Upon the whole however he was much less indebted to the analytical writings of Descartes than he was to those of his countryman Wallis. He seldom read without making comments upon the text or marginal notes of such parts as appeared to him susceptible of extension or improvement. In this way he completed the perusal of Descartes's 'Geometry,' after which he passed on to the 'Arithmetica Infinitorum' of Wallis. In this work the author had suggested a method of obtaining the quadrature of the circle, the practicability of which depended upon an interpolation. Newton set about effecting this, notwithstanding the discouraging declaration of Wallis, that he believed it to be impracticable. The attempt however proved not merely successful, but in the course of his inquiry he was led (1663-4) to a discovery of greater moment, the history of which is given under BINOMIAL THEOREM. This theorem, combined with the previous labours of Wallis and others, supplied Newton with a method of determining the area and rectification of curves, the surface and content of the solids formed by their revolution, and the position of their centre of gravity; and by similar means he solved with comparative ease a number of problems which had hitherto baffled the attempts of mathematicians, or of which solutions had been obtained only under particular circumstances, whereby the real difficulty had been rather evaded than overcome. The almost indefinite application which he continued to make of this method, computing even the numerical values of the formulæ to which his investigations gave rise, as if he regarded the occupation rather as a source of amusement than of labour, may possibly have been suggested by the view, as novel as it was important, which he took of the mode whereby magnitudes of every kind may be conceived to be generated, and by the notion he early entertained of the possibility of deducing the definite value of a variable magnitude from the velocity of its increase or diminution.

The fluxionary calculus to which this opinion gave rise was invented by Newton in or before the year 1665. Its history is given in the article FLUXIONS. The following year he composed his 'Analysis per Equationes Numero Terminorum Infinitas,' a tract which afterwards caused much discussion as to the extent to which it contained the method of fluxions. For some reason which it is now difficult to assign, he thought proper to conceal the substance of this tract from the public and even from his friends. However on the appearance of Mercator's 'Logarithmotechnia' in 1668, in which work Newton having recognised two of the many results to which his binomial theorem had previously conducted him, namely, the development of log $(1+x)$ and the determination of the quadrature of the hyperbola, he communicated the tract above mentioned to his friend Dr. Barrow. This was not till the month of June, 1669. The 31st July following, Barrow, with Newton's permission, transmitted the MS. to Mr. Collins, at the same time acquainting him that it was the production of a young friend of his who possessed a fine genius for such inquiries. Collins took a copy of the MS. and returned the original to Dr. Barrow. The copy was afterwards found among Collins's papers, and attested the year in which the original treatise had been composed. It was first formally published in 1712, but long previous to that its contents must have been pretty widely diffused through Collins's correspondence with many of the principal mathematicians of the day, both in England and upon the Continent.

Newton was admitted sub-sizar in 1661, became scholar in 1664, and took his degree of B.A. in 1665. In 1664-5 he was a candidate with Mr. Robert Uvedale for the law-fellowship of Trinity College; when Barrow, having found the candidates on an equality as regarded attainments, conferred the appointment on Mr. Uvedale, he being the elder. In 1667 he became junior fellow, took the degree of M.A., and became senior fellow in 1668. He succeeded Dr. Barrow as Lucasian professor of mathematics in 1669.

The raging of the plague, in 1665-6, induced Newton to quit Cambridge and retire to Woolsthorpe. Here it was that he began to reflect more particularly upon the nature of the force by which bodies at the earth's surface are drawn towards its centre, and to conjecture that the same force might possibly extend to the moon, and there be of sufficient intensity to counteract the centrifugal force of that satellite, and thereby retain it in its orbit about the earth. To compare this hypothesis with observation, it was necessary to determine the law according to which the intensity of such a force would vary with the distance from the earth's centre; for although no sensible variation can be detected within the narrow limits of direct observation, namely, the summit of the highest mountains or the bottom of the deepest mines, it was reasonable to presume that some variation would be appreciable at the distance of the moon, and in such case only could the force be just sufficient to counteract the centrifugal tendency of the revolving satellite. To a mind so habituated to generalise, it was a natural extension of his hypothesis to suppose that the same kind of force which incessantly deflects the moon from a rectilinear path might likewise act upon the planets so as to retain them in their orbits about the sun. Now the assumption of an attractive force emanating from the sun was at this time far from being a novelty, and it had even been asserted by Bouillaud that if such a force really existed, its intensity would vary inversely as the square of the distance from the attracting body; but neither Bouillaud nor those who entertained similar opinions had given any proof, either empirically or otherwise, of what they had asserted; and certainly none appear to have attempted to establish that the forces which retain the planets in their orbs were identical, as to their nature, with that which draws a stone, when let fall, to the surface of the earth. Newton showed that the law of the inverse square of the distance is

that which really exists in nature; and further, that this law was a necessary consequence of the analogy already discovered by Kepler between the periodic times and the mean distances of the planets. The following will convey a notion of the line of reasoning by which Newton arrived at this result. The intensity of the force, whatever may be its nature, which counteracts the centrifugal force of a planet, is proportional to the versed sine of the arc described in a given time; so that if the time be small, the force will be proportional to the square of the arc divided by the planet's mean distance, or to the square of the linear velocity by the distance. If therefore for the velocity we substitute the ratio of the mean distance to the periodic time, which is proportional to it, we shall find that the force varies as the distance by the square of the periodic time, that is, by Kepler's law, as the distance by the cube of the distance, that is, inversely as the square of the distance. Having thus established the law whereby the planets gravitate towards the sun, he proceeded to examine whether the same law regulated the gravitation of the moon towards the earth. At this point it is that Newton's reasoning first rests upon conjecture, namely, that the force manifested at the earth's surface in the fall of a stone, is identical with that which is constantly deflecting the moon towards the centre of the earth, and that the law of its variation was the same as that which he had determined for the planets. If such were the case, the distance fallen through by the moon in one second of time ought to bear the same ratio to the distance fallen through by a body at the surface of the earth in one second, which the square of the earth's radius bears to the square of the moon's mean distance. The length of the earth's radius, which, entered as a necessary element in the verification of his conjecture, was at that time very imperfectly known (a degree of latitude being estimated at only 60 miles instead of 69½ miles, its more correct length); the consequence of which was, that the result of his calculation indicated a force at the distance of the moon greater, by nearly one-sixth, than that deduced from direct observation. This difference, which many would have considered sufficiently small to establish the correctness of the hypothesis, was regarded by Newton rather as a direct refutation of its truth. He therefore laid aside further consideration of the subject, suspecting, says Whiston ('Memoirs' of himself), that some unknown cause, perhaps similar to the vortices of Descartes, modified, in the case of the moon, the law which he had satisfactorily established with regard to the planets.

In 1666, the plague having subsided, he returned to Cambridge, but without mentioning to any of his friends the interesting inquiry which, during his absence, had occupied so much of his attention. In this way the discarded hypothesis lay dormant for sixteen years. In 1682, when attending a meeting of the Royal Society, he casually heard of the measurement of an arc of the meridian which had been executed by Picard three years before. Having taken a note of the result, and thence deduced the length of the earth's radius, he resumed his former calculation; but in the course of the work, observing that the conclusion he had formerly anticipated was about to be realised, his ardour is said to have brought on a state of excitement and nervous irritability which precluded his further progress, so that the completion of the calculation was confided to a friend. The following year he transmitted to London a few propositions on the motion of bodies acted on by centripetal forces, which were shortly after communicated to the Royal Society, and constitute the leading propositions of the 'Principia.' The manuscript of this work, entitled 'Philosophiæ Naturalis Principia Mathematica,' was presented to the Royal Society by Dr. Vincent in 1686. Its perusal gave rise to many remarks from Dr. Hooke respecting the deduction of the law of the inverse square of the distance from the second law of Kepler, to which he laid claim. Hooke's pretensions upon this head were never made out; and from the known mediocrity of his mathematical attainments, as well as his general disposition to appropriate every new discovery to himself, they are looked upon as very doubtful. Newton however having apparently replied to his remarks with more warmth than discretion, he (Newton) afterwards expressed a willingness to compromise the dispute by the insertion of a scholium (lib. i., prop. iv., cor. 6), wherein the controverted deduction is attributed independently to Sir Christopher Wren, Hooke, and Halley. The printing of the 'Principia' was superintended by Dr. Halley, and the expense defrayed by the Royal Society. It appeared in 1687, London, 4to. For an account of this memorable work, the reader is referred to PRINCIPIA.

The theory of universal gravitation advanced by Newton, wherein each particle of matter is supposed to attract all other matter in the direct proportion of its mass, and inversely as the square of the distance, is, from its nature, insusceptible of direct demonstration, and could only be established by showing that the phenomena of nature were in no instance opposed to such a supposition, and that it was sufficient to the explanation of those phenomena. Newton did much towards this; but the completion of the proof required the labours of many succeeding mathematicians and astronomers, and this may, in some measure, account for the qualified reception which the theory met with at the hands of Huyghens, who, though he acknowledged the mutual gravitation of the masses of matter, refused his assent to the assumed attraction between their ultimate particles. The opposition to the theory made by Leibnitz, the erroneous and unphilosophical principles which he endeavoured to substitute in its stead, and the meanness with which he sought to injure the reputation of Newton by designating the theory subversive of true religion, are equally prejudicial to his scientific and moral fame. The long interval that elapsed before the writings of Newton began to be generally understood and his doctrines appreciated, is attributable exclusively, as regards England, to their inherent abstruseness. On the Continent they had further to contend with established prejudices in favour of the doctrines of Descartes.

The latter half of the seventeenth century is not less remarkable for its optical discoveries than for the zeal with which the physical sciences generally were prosecuted. The proportionality of the sines of the angles of incidence and refraction, which furnishes an easy explanation of all the circumstances attending the simple refraction of homogeneous light, had been discovered, and the discovery attributed to Descartes, though now known, on the authority of Vossius and Huyghens, to have been due to Snell, a Dutch physician, who died in 1626. From this law Descartes had been able to explain the theory of the refracting telescope, but had fallen into error by attributing the defects of such instruments solely to the spherical aberration of the lenses employed in their construction. Had such been the case, it is obvious that the whole of the aberration might have been removed by merely varying the form of the lenticular surface. Descartes accordingly, in his 'Dioptrice,' published in 1629, and James Gregory, in his 'Optica Promota,' published in 1663, had investigated the forms which they believed it would be necessary and sufficient to give to the lenses, in order that parallel rays transmitted through them should converge to a point or focus with mathematical accuracy. The aberration of sphericity was however but a trifling impediment to the perfection of dioptrical instruments, compared with what is now designated chromatic aberration, or the aberration of refrangibility, which arises from the then undiscovered fact that light is not a homogeneous substance, but composed of rays, some of which are more susceptible of refraction than others. In the year 1666 we learn ('Letter of Newton to Oldenburg,' *Phil. Trans.*) that Newton, in common with many other philosophers at that time, occupied himself in the attempt to grind object-glasses in conformity with the precepts of Descartes and Gregory, and while thus occupied he seems to have conjectured that the defects of refracting telescopes might arise from some other cause than that which had hitherto been exclusively assigned. Either this conjecture or accident led him to consider the phenomenon of the prismatic spectrum (vol. ix., p. 20), which was then well known to philosophers, although it had been explained by none. In doing so he remarked that the angle subtended at the aperture of his shutter by the length of the spectrum was considerably greater than that subtended by the sun's diameter, though, according to the received law of refraction, these angles ought to have been sensibly equal. After modifying the experiment in various ways, and assuring himself that this discrepance did not arise from any irregularity in his prism, the thought fortunately suggested itself of trying the separate effect of the prism upon each of the coloured lights of the spectrum. Accordingly, having transmitted them successively through a second prism at the same angle of incidence, he found—1, that the colour was in no degree affected by this second refraction; 2, that the spectrum formed by each colour occupied a distinct position on

the screen, so that the deviation from the direction of the primitive ray was different in all, being greatest in the violet and least in the red. He therefore came to the important conclusion 'that light was not homogeneous, but composed of rays, some of which were more refrangible than others.' This discovery must have been made subsequent to the publication of Wallis's optical lectures, which appeared in 1669, for otherwise it is improbable that Newton, to whom the revisal of the MS. was confided, and who receives the author's acknowledgements for having 'corrected several oversights, and made some important corrections,' would have permitted his friend to promulgate views so erroneous.

In the above year however Newton began to deliver a course of lectures on optics at Cambridge, and the composition of white light formed part of the course. Seeking the complete development of the consequences of his discovery, 'he was conducted,' says M. Biot, 'to a multitude of observations no less admirable for their novelty and importance, than for the sagacity, address, and method with which he contrived, executed, and linked them one with the other. He thence composed his system of optics, wherein the fundamental properties of light were for the first time unveiled and established, and classed according to pure experience alone, without the slightest intermixture of hypothesis; a method of procedure which was then as surprising and as little heard of as the properties themselves:....both the physical and natural sciences were at this time so mixed up with mere opinions, that few persons were capable of discriminating between a vague conjecture and a precise idea, between a physical hypothesis and a law of nature rigourously demonstrated.'

Although Newton had been thus successful in his optical inquiries, and had detected the principal source of indistinctness in refracting telescopes, he not only did not see how this indistinctness might be removed, but even designated all attempt as 'desperate' (*Optics*, lib. i., prop. 7); and the long interval which elapsed before the discovery of the achromatic telescope may be attributed to the unmerited reliance which in this instance was placed in his decision. He regarded as a self-evident truth, which it therefore needed neither reason nor observation to confirm, that the spectra formed by different refracting media were always of equal length whenever the refraction of the mean ray was the same; in other words, that the dispersive powers of different media were the same where their indices of refraction corresponding to the mean ray were equal; and although the fact was controverted by some of the more respectable continental philosophers who assailed his doctrines, the circumstance appears to have neither shaken his belief, nor to have suggested the propriety of convincing his opponents by an appeal to experiment. An apparent analogy also between the lengths of the colours of the spectrum and the divisions of the harmonic chord, led him to suppose that the refractive indices of any medium corresponding to the different coloured rays might be deduced from a knowledge of the index of refraction corresponding to the mean. Had he happened to have repeated his experiments with different refracting substances, he could scarcely have failed to recognise the difference of their dispersive powers even when the refraction of the mean ray is the same. Many of his experiments he did repeat with a prism of water, but in this instance he mixed with the water 'a little sugar of lead' (Brewster), his object being merely to increase the refractive power of the water; but he thereby unknowingly also increased its dispersive power, and probably rendered it sensibly equal to the dispersion of the glass prism previously employed. By these mistakes he was induced to forego all attempts to perfect the refracting telescope, and directed his attention to the construction of reflecting telescopes on the principles pointed out by James Gregory, in his 'Optica Promota.'

In 1668-9 he had succeeded; and in 1671 he executed a second telescope 'with his own hands,' which is still carefully preserved in the library of the Royal Society. For the investigations of Newton relative to the colours of thin transparent substances the reader is referred to THIN PLATES. It was in order to explain the phenomena exhibited by such substances, and the partial reflexion and transmission of light incident upon diaphanous surfaces, that Newton devised his theory of 'fits of easy reflexion and transmission.' [LIGHT.] Speaking of Newton's theory of colour, Sir John Herschel remarks, 'It is a theory of extraordinary boldness and subtlety, in which great difficulties are evaded by elegant refinements, and the appeal to our ignorance on some points is so dexterously backed by the weight of our knowledge on others, as to silence if not refute objections which at first sight appear conclusive against it.' (*Encyc. Metrop.*, art. 'Light.')

In 1672 Newton was elected member of the Royal Society. In 1675 he received a dispensation from Charles II. to continue in his fellowship without taking orders. About the year 1687 he was appointed one of the delegates to defend the privileges of the university of Cambridge against the attacks of James II. In 1688 he took his seat in parliament as one of the representatives of the university, and was resident in London until the dissolution of parliament, which took place the following year. He was again returned in 1703, but lost his election in 1705. On no occasion does he appear to have taken any conspicuous part in the debates of the house. Prior to the year 1695, when he was appointed warden of the mint, with a salary of from 500*l.* to 600*l.* per annum, his pecuniary circumstances are said to have been rather straightened, and whatever may have been his own expectations, his friends seem to have reckoned upon some token of liberality from Charles II. and his successor. The profligate reign of the former, and the opposition which Newton had given to the wishes of James, sufficiently account for their expectations having been disappointed. His sole income is stated to have been derived from his Lucasian professorship, and from the produce of the manor of Woolsthorpe, the amount of which, though aided by habits remarkably temperate and abstemious, ill accorded with the natural generosity of his disposition and the frequent occasions which he probably had of relieving the necessities of his poorer relations. His fellowship however must have been an additional source of income, though we find no mention of its amount, and the notion of his having been in narrow circumstances most probably arose from the fact that in the Journal of the Royal Society there is entered an order in council, dated January 28, 1674-5, whereby he is excused from making the customary payment of one shilling a week 'on account of his low circumstances, as he represented.' (Birch, *Hist. of Royal Society*, iii., p. 179.) Four years after receiving the appointment of warden of the mint, he was promoted to the mastership of that establishment with a salary of from 1200*l.* to 1500*l.*, and at his death his personal estate was valued at 32,000*l.*

About the year 1676, Leibnitz having heard of many new results obtained by Newton by means of an infinite series (the Binomial Theorem), he expressed to Oldenburg his wish to be made acquainted with it. This led to a correspondence between Newton and Leibnitz, wherein the former also communicated many beautiful theorems on the quadrature, rectification, &c. of curves, to which he had been led by the aid of his method of fluxions, but at the same time withheld all information concerning the principles of that method except in the form of anagrams, which were very unlikely to be deciphered. The letters of Leibnitz in reply showed that he was already in possession of a method analogous to that of fluxions, and equally extensive in its applicability. An account of the dispute which afterwards arose between the English and foreign mathematicians, relative to the claims of Leibnitz as an independent inventor of the calculus, and the part which Newton himself took in the controversy, will be found in the article FLUXIONS (vol. x., pp. 331-2), and in COMMERCIUM EPISTOLICUM (vol. vii., p. 399).

The five years preceding Newton's appointment to the wardenship of the mint were passed chiefly at Cambridge. During parts of the years 1692 and 1693 he suffered under temporary mental aberration, although it was between December, 1692, and February, 1693, that he wrote his four celebrated letters on the existence of the Deity, at the express request of Dr. Bentley.

Mr. Van Swinden, while examining the MSS. and autograph letters of Huyghens, met with a small journal in the hand-writing of the latter. It is deposited in the library of Leyden, and contains the following note, communicated by Mr. Van Swinden to M. Biot, and first published by the latter in the 'Biographie Universelle.' '29th May, 1694. Mr. Colin, a Scotchman, informs me that the illustrious geometer Isaac Newton has been insane for the last eighteen months, either from excess of study, or from the grief occasioned by the destruction of his chemical laboratory, together with many important MSS., by fire. Mr.

Colin adds, that when he came to the archbishop of Cambridge, his conversation indicating an alienation of mind, he was immediately taken care of by his friends, confined to his room, and remedies applied, by means of which he has now so far recovered as to again be able to comprehend the Principia.' Huyghens having mentioned this circumstance to Leibnitz, the latter, in his reply, dated 23rd June, 1694, expresses his gladness at receiving the account of Newton's convalescence at the same time that he received that of his illness, and adds, 'It is to men like you and him, Sir, that I wish a long life.' Sir David Brewster has been at considerable pains to determine how far the foregoing statement is consistent with fact, and has succeeded in bringing to light many interesting documents which bear immediately upon this and other points. Among these is a manuscript diary of Mr. Pryme, a student at Cambridge, at the time that Newton was fellow of Trinity, which manuscript is now in the possession of his collateral descendant George Pryme, Esq., professor of political economy at Cambridge. It commences in the year 1685, and under 3rd February, 1692, the writer mentions having that day heard of the destruction of Newton's MSS. on the theory of colours, 'established upon thousands of experiments which he had been twenty years of making, and which had cost him many hundred of pounds,' and he goes on to say that it took place on a winter's morning while Newton was at chapel, adding that 'when Newton had come back and seen what was done, every one thought he would have run mad; he was so troubled thereat, that he was not himself for a month after.' Another version of the story is, that Newton left in his study a favourite dog, which overturned a lighted taper upon his papers, and on his return, finding the extent of his loss, he exclaimed, 'Oh, Diamond, Diamond, little do you know the mischief you have done me!' The above extract from the diary of Mr. Pryme, while it in some degree corroborates the statement in the Journal of Huyghens, seems to show that the indisposition of Newton was neither so intense nor of so long continuance as has been supposed, and that 'insanity' was inapplicable in the strict sense of that word, although there certainly existed some doubt as to what state of mind he was really in. This view is supported by letters in the hand-writing of Newton, of Mr. Pepys (secretary of the Admiralty), and of Mr. Millington (of Magdalen College, Cambridge), which have also been published by Sir David Brewster from the originals in the possession of Lord Braybroke. Among these is the following from Newton to Pepys, excusing himself from fulfilling a promise he had made to see the latter when next in London. Pepys entertained a very high esteem of Newton, and appears to have been very anxious for his health and longevity. 'September 13, 1693. Sir,—Some time after Mr. Millington had delivered your message, he pressed me to see you the next time I went to London. I was averse; but upon his pressing consented, before I considered what I did, for I am extremely troubled with the embroilment I am in, and have neither ate nor slept well this twelvemonth, nor have my former consistency of mind. I never designed to get anything by your interest, nor by King James's favour, but am now sensible that I must withdraw from your acquaintance, and see neither you nor the rest of my friends any more, if I may but leave them quietly, &c.,—Isaac Newton.' The wording of this letter excited in Mr. Pepys the suspicion that Newton was suffering from 'discomposure of head or mind, or both,' and he in consequence addressed himself for explanation to Millington, who in reply says, '. . . . . he (Newton) told me of his own accord that he had writt to you a very odd letter, at which he was much concerned; added that it was a distemper that much seized his mind, which he desired I would represent to you and beg your pardon, he being very much ashamed he should be so rude to a person for whom he hath so great an honour. He is now very well, and though I fear he is under some degree of melancholy, yet I think there is no reason to suspect it has at all touched his understanding, and I hope never will.' While labouring under the same melancholy and nervous affection, he had characterised the writings of Locke as immoral, and designated their author a Hobbist. In a letter to Locke, dated 'At the Bull in Shoreditch, September 16, 1693,' he says, 'Being of opinion that you endeavoured to embroil me with women, I was so much affected by it, that when one told me you were sickly and would not live, I answered, "'twere better if you were dead."' He then asks forgiveness for this uncharitableness, and for the ill opinion he had entertained of his writings, and concludes, 'I beg your pardon also for saying or thinking that there was a design to sell me an office, and am your most humble and unfortunate servant, Is. Newton.' In 1694 he appears to have recovered his former tranquillity and strength of mind; for in that year we find him actively occupied in testing his lunar theory by the observations of Flamsteed, with whom he had hitherto been on the most intimate terms. The quarrel which subsequently took place between Newton and the astronomer royal is noticed under FLAMSTEED.

In 1699 Newton was chosen foreign associate of the Royal Academy of Sciences at Paris; in 1703 he was elected president of the Royal Society, to which office he was annually re-elected till his death; and in 1705 he was knighted by Queen Anne. In 1722 he became subject to a disorder of the bladder, accompanied with cough and gout. He presided for the last time at the Royal Society on the 28th of February, 1727, and died at Kensington on the 20th of March following, in the eighty-fifth year of his age. His body was interred in Westminster Abbey, the funeral being attended by several of the nobility and the principal members of the Society. In 1731 a magnificent monument, designed by Kent and sculptured by Rysbrack, was erected in the abbey at the expense of his relatives. It is situated immediately behind the organ, and bears an appropriate inscription ending with 'Sibi gratulentur mortales tale tantumque exstitisse humani generis decus.' It is not true that the binomial theorem is also engraven upon it, though it is so stated under 'Binomial Theorem,' on the authority of several writers. The same year a medal was struck at the Tower, bearing on one side the head of Newton, with the motto 'Felix cognoscere causas;' and on the reverse a personification of the mathematical sciences. In 1755 a full-length statue, by Roubilliac, was erected in Trinity College chapel, bearing the word Newtonus with the inscription from Lucretius, 'Qui genus humanum ingenio superavit.' There is also a bust of Newton in Trinity College library, by the same sculptor. Besides these memorials of Newton there exist several portraits of him by Vanderbank, Ritts, Sir Godfrey Kneller, and Sir Peter Lely: the last was taken when Newton was a B.A. The manor-house of Woolsthorpe, recently visited by the writer, is built of stone, and seated in a valley on the west side of the river Witham. It was repaired in 1798 by Mr. Turner, the late proprietor, by whom also a marble tablet was placed over the mantelpiece of the room in which Newton was born. It bears the inscription, 'Sir Isaac Newton, son of Isaac Newton, lord of the manor of Woolsthorpe, was born in this room on the 25th of December, 1642.' At foot are the lines from Pope,

'Nature and nature's laws lay hid in night:
God said, "Let Newton be," and all was light.'

In a room on the same floor is preserved his oaken study, converted by the present occupant into a lumber closet. The two dials engraved upon the southern wall are still very distinct, but the styles of both are wanting. The larger dial is about a foot in diameter. The celebrated apple tree, the fall of one of the apples of which is said by Pemberton to have turned the thoughts of Newton to the subject of gravitation, was thrown down by the wind about five years since. A drawing has been preserved of it in its prostrate position, and another tree grafted on its stock.

In his person Newton was short, but well set, and inclined to corpulence. His hair was abundant, and white as silver, without baldness. His eye was bright and penetrating till within the last twenty years of his life; but his countenance, though thoughtful, seldom excited much expectation in those to whom he was unknown. In his conversation there appears to have been little either very remarkable or agreeable; but we have the testimony of Dr. Pemberton that 'neither his age nor his universal reputation had rendered him stiff in opinion, or in any degree elated.' Ascribing whatever he had accomplished to the effect of patient and continuous thought rather than to any peculiar genius with which nature had endowed him, he looked upon himself and his labours in a very different light from that in which both he and they were regarded by mankind. 'I know not,' he remarked, a short time before his death, 'what I may appear to the world; but to myself I seem to have been only like a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst

the great ocean of truth lay all undiscovered before me.' (Turner's *Collections relative to the Town of Grantham*.) But while he thus contrasted the littleness of human knowledge with the extent of human ignorance, he was fully conscious of the importance of his own labours, when compared with those of his predecessors and contemporaries, and evinced a natural readiness to assert and vindicate his rights whenever occasion might require. It were to be wished that, by an earlier publication of his discoveries, he had adopted the most eligible mode of establishing the undoubted priority of his claim. Such a course, by changing the current of events, would have left him less open to the charge of having disregarded the claims of others, or of having suffered their reputations to be prejudiced by his silent acquiescence in the acts of his colleagues. To judge of Newton from the life of him recently published by Sir David Brewster, we could only infer that his moral character had suffered from no one instance of human infirmity, and that every action had been dictated by feelings of benevolence and the love of truth. These were indeed the general motives by which he was actuated. The unrefuted disingenuousness of his behaviour towards Leibnitz, relative to the discovery of the calculus, and the yet more discreditable part which he took in the persecution of Flamsteed by the Royal Society, are exceptions. Sir David Brewster considers Leibnitz to have been the only aggressor, Newton the only sufferer. The MS. autobiography of Flamsteed was not discovered by Mr. Baily till the year following that in which Sir D. Brewster published his life of Newton.

The following is a list of the works of Newton, in the order of publication:—

1. 'Principia,' 1687, Lond., 4to.; 1713, Camb., 4to., edited by Cotes; 1726, Lond., 4to., edited by Pemberton; 1730, Lond., 2 vols. 8vo., illustrated by Donick; 1729, Lond., 2 vols. 8vo., Englished by Motte. Besides these, several editions have been published on the Continent. The best edition is that of MM. Le Seur et Jacquier, 1739-42, Genev., 4 vols. 4to., comprising a valuable running commentary on the text, and generally known as the 'Jesuits' edition.' The same, 1760, Colon. Allobrog.; the same, 1822, Glasgow, 4 vols. 8vo., edited by Wright. (Horsley, tom. ii. and iii.)

2. 'Optics,' Lond., 1704, 4to. To the first edition, written in English, were appended two Latin treatises, viz. 'De Quadratura Curvarum,' containing an exposition of his method of fluxions; and 'Enumeratio Linearum tertii Ordinis,' containing an elegant classification of seventy-two curves of the third order, with an account of their properties, but without any information as to the method whereby those properties had been investigated. These treatises, which had little connection with the principal work, were omitted in the subsequent editions. A Latin translation of the 'Optics,' by Dr. Clarke, appeared in 1706, Lond., 4to., for which Newton presented the doctor with 500*l.* The other editions are, in English, Lond., 1714, 1721, 1730; in Latin, Lond., 1719, 1721, 1728, Lausanne, 1740, Padua, 1773. (Horsley, tomes i. and iv.)

3. 'Arithmetica Universalis,' 1707, Camb., 8vo., comprising the algebraical lectures delivered by Newton at the university, printed under the inspection of Whiston, and, according to some authorities, without the author's consent. Translated by Raphson, 1728, Lond., 8vo. There are several later editions, both English and foreign. That by Castillon, Amst., 1760, is in 2 vols. 4to. (Horsley, tom. i.)

4. 'Analysis per Equationes Numero Terminorum Infinitas,' 1711, Lond., 4to. Translated by Stewart, 4to., Lond., 1745. This work was written by Newton, about the year 1672, and intended as an introduction to Kinckhuysen's 'Algebra,' of which he had undertaken to publish a new edition. Motives now unknown induced him to abandon this design. (Horsley, tome i.)

5. 'Methodus Differentialis,' a small tract on interpolation. (Horsley, tome i.)

6. 'De Mundi Systemate,' 1728, Lond., 4to. This is a popular account af the truths contained in the third book of the 'Principia.' An English translation from the original MS. had been published the previous year in 8vo. There are later editions. (Horsley, tome iii.)

7. 'The Chronology of Antient Kingdoms amended: to which is prefixed a Chronicle from the first memory of things in Europe to the conquest of Persia by Alexander the Great,' 1728, Lond., 4to. It had been surreptitiously translated and published at Paris, in 1725. The reader will find an able review of this work, by M. Daunon, appended to Biot's Life of Newton in the 'Biographie Universelle,' tome xxi., pp. 180-6. (Horsley, tome v.)

8. 'Table of Assays,' printed in Dr. Arbuthnot's 'Tables.'

9. 'Optical Lectures,' 1728, Lond., 8vo., comprising those delivered in the years 1669-70-71. Translated into Latin, 1729, Lond., 4to. (Horsley, tome iii.)

10. 'Observations on the Prophecies of Daniel and the Apocalypse of St. John,' 1733, Lond., 4to. (Horsley, tome v.)

11. 'A method of Fluxions and Analysis by Infinite Series,' translated into English from the original Latin by John Colson, to which is added a Commentary by the translator, 1736, Lond., 4to.

12. 'An Historical Account of two notable Corruptions of Scripture,' written prior to 1691, but first published in 1754, Lond., under the title of 'Two Letters from Sir Isaac Newton to M. Le Clerc.' (Horsley, tome v.) Newton contributed some papers to an edition of Varenius's 'Geography,' printed at Cambridge in 1672, 8vo.

The papers communicated by Newton to the Royal Society are comprised in vols. vii.-xi. of the 'Transactions.' The principal works of Newton were collected and published by Dr. Horsley, under the title of 'Newtoni Opera quæ extant omnia,' 1779-85, Lond., 5 vols. 4to. In the foregoing list, where a work had been reprinted in Horsley's edition, reference is made to the volume. The following were, with few exceptions, first printed in Horsley's edition:—Tome i., 'Excerpta quædam ex Epistolis Newtoni ad Series Fluxionesque pertinentia;' 'Artis Analyticæ Specimina, vel Geometria Analytica.' Tome iii., 'Theoria Lunæ.' Tome iv., 'Letters on various Subjects in Natural Philosophy, published from the Originals in the Archives of the Royal Society;' 'Letter to Mr. Boyle on the Cause of Gravitation;' 'Tabulæ duæ, Calorum altera, altera Refractionum;' 'De Problematibus Bernouillianis;' 'Propositions for determining the Motion of a Body urged by two Central Forces;' 'Four Letters to Dr. Bentley;' 'Commercium Epistolicum D. Johannis Collins, et aliorum, de Analysi Promota' (first published by the Royal Society in 1713: a new edition appeared in 1722); 'Additamenta Commercii Epistolici.' Tome v., 'A short Chronicle from a Manuscript, the property of the Rev. D. Ekins, dean of Carlisle.' The minor works of Newton have been collected and published under the title of 'Opuscula Mathematica, Philosophica, et Philologica; collegit partimque Latine vertit ac recensuit Joh. Castillioneus;' Laus. et Genev., 3 tomes 4to. After the death of Newton, Dr. Pellet was appointed by the executors to examine his manuscripts and papers, and to select such as he deemed adapted for publication. They are eighty-two in number, and consist of a great number of sheets. But many of those on theological subjects are mere copies over and over again, with very slight variations. Of these MSS., the only ones which Dr. Pellet deemed fit to be printed were 'The Chronology' and 'An Abstract of the Chronology,' the former in ninety-two, the latter in 12 half-sheets folio. At the same time he recommended for further consideration those entitled 'De Motu Corporum;' 'Paradoxical Questions concerning Athanasius;' 'History of the Prophecies;' and a bundle of loose mathematical papers. A catalogue of these MSS. was appended to a bond given by Mr. Conduit to the administrators of Newton, wherein he binds himself to account for any profit he may make by their publication. A list of them will be found in Hutton's 'Dictionary.' Those on theological subjects are at present, we believe, in the possession of the family of the earl of Portsmouth. In addition may be mentioned the valuable and hitherto unpublished collection of letters between Newton and Cotes, relative to the publication of the second edition of the 'Principia,' preserved in the library of Trinity College, Cambridge; the Correspondence of Newton with Mr. Pepys and Mr. Millington, in the possession of Lord Braybroke; and other MSS. in the Bodleian library, Oxford.

(Brewster's *Life of Newton*, Lond., 1831, 12mo.; Biot's *Life*, in the *Biog. Univers.*; Turner's *Collections for the Hist. of Grantham*, containing the Papers forwarded to Fontenelle by Conduit, the husband of Newton's niece, and Dr. Stukeley's Account of the Infancy of Newton, written in 1727; Fontenelle's 'Eloge de Newton,' *Œuvres diverses*, La Haye, 1729, 4to., tome iii.; *Biographia Britannica*; Birch's *Hist. of the Royal Society*, Lond., 1756-7, 4to., vol. iii. and iv.; *Heads of illustrious Persons of Great Britain, engraved by Houbraken and Vertue, with their*

Lives, by Birch, Lond., 1743, fol., tome i., p. 147. The reader may further consult Montucla, *Hist. des Mathem.*, tomes ii., iii., iv.; Pemberton's *Account of Newton's Philosophy*; Maclaurin's *Account of Newton's Discoveries*; Priestley's *History of Optics*; Laplace, *Exposition du Système du Monde*, chap. v.; Lord King's *Life and Correspondence of Locke*; *Life of Newton*, in the *Library of Useful Knowledge*, &c.)

NEWTON'S PRINCIPIA. [PRINCIPIA.]

NEWTON, THOMAS, born 1704, died 1782, having been for the last twenty years of his life bishop of Bristol, and for the last fourteen dean of St. Paul's; a prelate of not very remarkable powers, natural or acquired, but a man without reproach, acceptable in the society of the great, and possessed of a certain amount of general and professional knowledge.

He is chiefly known by two works: an edition of the 'Paradise Lost,' with notes, first published in 1749, and his 'Dissertation on the Prophecies,' of which the first volume appeared in 1755. Both had a certain, perhaps a high, celebrity in their day, but we look in them in vain for much of either acuteness or learning. Both however may be perused by those who do not profess to be themselves critical scholars with advantage; and the critical scholar in English or in biblical literature may meet occasionally with useful suggestions. It is perhaps unfortunate for the bishop that a comparison is provoked between his work on Milton and the edition (a model of works of that class) of the minor poems by Warton.

Bishop Newton's course of life was very like that of other divines who have risen to the episcopal bench. He was the son of a person engaged in trade, was a pupil in the grammar-school at Lichfield, and afterwards at Westminster, from whence he removed to Trinity College, Cambridge; was for some years a city preacher, and tutor in the Tyrconnel family, and in 1744 presented by Pulteney earl of Bath, who was his great friend and patron, to the living of St. Mary-le-Bow. He next became lecturer at St. George's, Hanover Square, prebendary of Westminster, dean of Salisbury, sub-almoner, bishop of Bristol, and finally dean of St. Paul's.

NEWTOWN STEWART, a town in the parish of Ardstraw, barony of Strabane, county of Tyrone, and province of Ulster. It is seated on the left bank of the Moyle, or Mourne, 9 miles (English) north by west from Omagh, and 116 miles (English) north-west by north from Dublin (direct distances). It derives its name from Sir William Stewart, to whom the adjacent lands were granted by Charles I. Being surrounded by the mountains of Munterloney, and commanding the only pass in this mountainous district, it was formerly regarded as a place of some importance. In 1689 it was burnt by order of James II., and remained a mere heap of ruins till 1727, when it was restored by the Stewart family. The parish church, 'a handsome building,' was erected the same year, at the expense of Dr. Hall, the then vicar of Ardstraw, and subsequently bishop of Dromore. Young, in 1780, described this place as 'a row of neat stone and slate cabins.' It now consists of three streets, which are tolerably well built and paved, and contains one or two inns. Its population, in 1831, was 1737, that of the entire parish of Ardstraw being 18,617. Many of the inhabitants are employed in the neighbouring quarries. The market-day is Monday. The fairs are held on the last Monday in every month.

(Young's *Tour in Ireland*, Lond., 1780, 4to.; *Population Returns*.)

NEWTOWN. [MONTGOMERYSHIRE.]

NEXT OF KIN. [CONSANGUINITY; INTESTACY.]

NIAGARA RIVER AND FALLS. The Niagara river unites lake Erie with lake Ontario, which is 334 feet lower than lake Erie. The river descends through this difference in level in the space of about 33 miles. Near the place where it issues from lake Erie the river runs through a level country, and its banks are not much elevated above the surface of the water. The current is gentle, hardly exceeding two miles and a half an hour. The width of the river is about one mile, and it preserves this width until it arrives at Grand Island, by which it is divided into two arms. About ten miles lower down, at Navy Island, both arms re-unite, and at this place the river is about two miles wide. A little lower down, at the mouth of the Welland or Chippeway river, it suddenly contracts to less than a mile, and its current rapidly increases from three to seven or eight miles an hour. The course of the river in this part is nearly due west, and its banks begin to rise first to ten or twelve feet, and soon to twenty, thirty, and fifty feet above the surface of the water. This rising of the banks is not the effect of a rise in the surrounding country, which in fact preserves its level in a continuous plain, but it is owing to the bed of the river descending on an inclined plane. The waters are borne down with great force against the Canadian side, and driven back by the high rocky banks, for at this point the river suddenly turns to a course which is east of north, and immediately afterwards the great volume of water is hurled down over a perpendicular height of 160 feet into a terrific gulf. Goat Island divides the cataract. This island is about 320 yards wide. The cataract between it and the American side is 320 yards wide, and 162 feet high; but between the island and the Canadian side it is 700 feet wide and 150 feet high. Both falls unite before they are lost in the gulf below. The American cataract descends nearly in a perpendicular line, and is divided into two cataracts by a small rock. The fall between this rock and Goat Island is only ten yards wide, and is called the cataract of Montmorenci. The Canadian cataract rolls over a precipice projecting about fifty feet beyond its base, and the falling water forms a curve, between which and the rock itself persons may safely proceed thirty or forty yards. This is called the Horse-Shoe Fall. To accommodate the travellers who visit the falls, a wooden bridge has been thrown across the American Fall to Goat Island, a few yards above the very crest of the cataract, and on the Canadian side a platform has been extended so far as to enable the traveller to look immediately over the awful abyss. Below the Falls the river flows with considerable rapidity between banks from 200 to 300 feet high. These banks are perpendicular for about half their descent, but towards the base they form a slope composed of the fragments which have fallen from above. Four miles below the Falls, in a semicircular basin, there is a terrific whirlpool formed by the water, which descends into the vortex with furious impetuosity, and rushes out between a narrow passage formed by perpendicular cliffs. Not far from this place the river passes the low ridge called Queenston Heights, and enters the level country which surrounds lake Ontario.

This enormous volume of water is thrown over a mass of limestone rock, which lies in horizontal strata: below the limestone there is a thicker mass of soft shale, which crumbles away rapidly; so that the limestone above overhangs it forty feet or more, and fragments of the superior rock fall down from time to time. Thus the cataracts are slowly changing their position, and moving nearer to lake Erie. The deep channel in which the river flows below the Falls seems to owe its origin to the same cause that is now in operation; and it is not improbable that the Falls were once at Queenston, which is now seven miles below the cataract. The high table-land extends from Queenston to lake Erie

The Niagara descends—

From lake Erie to the head of the Rapids above the Falls . . .	15 feet
By the Rapids above the Falls . .	51 ,,
By the Great Fall on the American side .	162 ,,
From the base of the Falls to Queenston .	104 ,,
From Queenston to lake Ontario . .	2 ,,
	334 feet

To obviate the interruption which the Falls of the Niagara cause to navigation, the Welland Canal has been made on the Canadian side. [CANADA.]

(Basil Hall's *Travels through North America*; MacGregor's *British America*; Bouchette's *British Dominions in North America*; Darby's *View of the United States*; and Fowler's *Journal of a Tour in the State of New York*; Lyell's *Geology*, i. 275; Mr. Bakewell, jun., *On the Falls of Niagara*, in Loudon's *Mag. of Nat. Hist.*, xii.)

NIAS. [SUMATRA.]

NICÆA. [ANATOLIA.]

NICANDER, a physician, poet, and grammarian, of whose life very few particulars are found in antient authors, and even those few are doubtful and contradictory. Upon the whole it seems most probable that his father's name was Damnæus (Eudociæ *Viol.*, *ap. Villois. Anecd. Gr.*, vol. i., p. 308, and *Anonymi Scriptoris*, '*Vita Nic.*'); that he lived about Ol. clxi., ii., 135 B.C., in the reign of Attalus III., the last king of Pergamus, to whom he dedicated one of his poems which is no longer extant (Suidas; Eudoc.,

Viol.; Anon. Vita); that he was a native of Claros (Nicandri *Theriaca*), a small town near Colophon, whence he is commonly called *Colophonius* (Cic., *De Orat.*, lib. i., cap. 16; Suidas, *Anthol. Gr.*); and that he succeeded his father as hereditary priest of Apollo Clarius (Eudoc., *Viol.; Anon. Vita*). He appears to have been rather a voluminous writer, as the titles of more than twenty of his works have been preserved; but of all these we possess at present only two in a perfect state, with a few fragments of some of the others.. The 'Theriaca' is a poem consisting of nearly 1000 lines in hexameter verse, on the wounds caused by different venomous animals, and the proper treatment of each: it is characterised by Haller (*Biblioth. Botan.*) as 'longa, incondita, et nullius fidei farrago.' It contains however several curious passages relating to natural history, of which the following may serve as a specimen. He mentions (v. 147, &c.) a species of serpent, called σήψ, which always assumes the colour of the ground over which it crawls.* He places (v. 183, &c.) the venom of serpents in a membrane surrounding the teeth, which is not very far from the truth. He describes the ichneumon (v. 190, &c.) and the asp, and the way in which the former fights with the latter and destroys its eggs; all of which is described in very nearly the same terms by Pliny (*Hist. Nat.*, lib. viii., cap. 35, 36), and in a great measure confirmed by modern naturalists. (See Cuvier's notes on the above-mentioned chapters of Pliny, in the French translation, 20 vols. 8vo., Paris, 1829-33.) In speaking of the amphisbæna, he falls into the vulgar error of his day, and describes it as having two heads (v. 372, &c.). The same error is found in Pliny (*Hist. Nat.*, lib. viii., cap. 35). He divides scorpions into nine species, distinguishing them chiefly by their colour (v. 769, &c.), a mode of division probably taken from Apollodorus (Pliny, *Hist. Nat.*, lib. xi., cap. 30), and followed by Ælian (*De Nat. Anim.*, lib. vi., cap. 20). He is the first person who describes the moths that flutter about a candle at night, and calls them φάλαιναι (v. 759, &c.). He gives a fabulous account of the basilisk (v. 396, &c.), which is followed, as might be expected, by Pliny (*Hist. Nat.*, l. viii., cap. 33, and l. xxix., c. 19), and by Ælian (*De Nat. Anim.*, lib. ii., cap. 7), though it should be observed that the animal spoken of by them could not be the same that is called by that name by modern naturalists, which is found only in America. [Basilisk; Cockatrice.] He declares the bite of the field-mouse to be poisonous (v. 815, &c.), and that the animal dies if it should fall into a wheel-rut; both which circumstances are repeated by Pliny (*Hist. Nat.*, lib. viii., cap. 83) and Ælian (*De Nat. Anim.*, lib. ii., cap. 37). He is one of the earliest writers who mentions the fable of the salamander (v. 817, &c.). See Pliny, *Hist. Nat.*, lib. x., c. 86, and Ælian, *De Nat. Anim.*, lib. ii., c. 31. He says that wasps (v. 738, &c.) are generated by the putrefaction of the carcass of a horse (comp. Pliny, *Hist. Nat.*, lib. xvii., cap. 18, and Ælian, *De Nat. Anim.*, lib. i., cap. 28), and bees by that of an ox (comp. Ælian, *De Nat. Anim.*, lib. ii., cap. 57).

The 'Alexipharmaca' is a rather shorter poem, written in the same metre, on poisons and their antidotes, and may be considered as a sort of continuation of the 'Theriaca.' Haller's judgment on this work is as severe as on the preceding. He says of it, 'Descriptio vix ulla, symptomata fusè recensentur, et magna farrago et incondita plantarum potissimum alexipharmacarum subjicitur.' Among the poisons of the animal kingdom he mentions (v. 115, &c.) the cantharis of the Greeks, which is not the *Lytta Vesicatoria*, but the *Melöe Chicorii*; the buprestis (v. 335, &c.), *Carabus Bucidon*; the blood of a bull (v. 312); the coagulated milk in the stomach of mammiferous animals (v. 364, &c.); a species of tetraodon (v. 465, &c.), *Tetraodon Lagocephalus*; the leach (v. 495, &c.), *Hirudo venenata*; and a species of gecko, σαλαμάνδρα (v. 550, &c.). Among the vegetable poisons we find the aconite (v. 12, &c.), 'Aconitum Lycoctonum;' the coriander (v. 157, &c.), which has sometimes been fatal in Egypt; the hemlock (v. 186, &c.), 'Conium;' the colchicum (v. 249, &c.), ἐφήμερον; the Lotos dorychnium (v. 376, &c.); the henbane (v. 415, &c.), 'Hyoscyamus;' opium (v. 433, &c.); and the different species of fungi (v. 521, &c.), the growth of which Nicander attributes to fermentation. Of mineral poisons he mentions only white lead, or carbonate of lead (v. 74, &c.), and litharge, or protoxide of lead (v. 607, &c.).

To counterbalance in some degree Haller's unfavourable opinion of Nicander's extant works, it ought in justice to be stated that his knowledge of natural history appears to be at least equal to that of other writers of his own or even of a later age, while on the subject of poisons he was long considered a great authority: Galen several times quotes him, and Dioscorides, Aëtius, and Johannes Actuarius have borrowed from him largely.

With respect to his merits as a poet, the most opposite opinions are to be found both in antient and modern writers. In the Greek anthology Colophon is congratulated for being the birth-place of Homer and Nicander (t. iii, p. 270, ep. 567, ed. Brunck.). Cicero (*De Orat.*, lib. i., cap 16), alluding to his 'Georgics' (a poem not now extant), praises the poetical manner in which he treats a subject of which he was entirely ignorant; while Plutarch (*De Aud. Poëtis*, cap. 2) says the 'Theriaca' only escapes being prose because it is put into metre, and will not allow it to be called a poem, because there is in it 'nothing of fable or falsehood.' This very point Julius Cæsar Scaliger thinks worthy of especial commendation, and says, 'Magna ei laus quod ne quid ineptum aut ineptè dicat.' (*Poëtices*, lib. v., cap. 15.) He goes on to praise the accuracy of his expressions and versification, and declares that among all the Greek authors a more polished poet is hardly to be found. M. Merian, on the other hand, in an essay 'Comment les Sciences influent dans la Poësie' (*Mém. de l'Acad. Roy. de Berlin, l'an* 1776, p. 423) mentions Nicander to show the antipathy that exists between the language of poetry and the subjects of which he treated. He calls him 'a grinder of antidotes, who sang of scorpions, toads, and spiders,' and considers his poems as fit only for the apothecaries. Probably his poetical genius has been a good deal cramped by the prosaic character of the subjects that he has chosen for his theme; and we may fairly say that his writings contain quite as much poetry as could be expected from such unpromising materials. As for his style and language, probably every one who has ever read half a dozen lines of either of his poems will agree with Bentley, who says that he studiously affected obsolete and antiquated words, and must have been an obscure writer even to his contemporaries. (*Cambridge Museum Crit.*, vol. i, p. 371.)

The 'Theriaca' and the 'Alexipharmaca' were first published in Greek, with the Scholia to both poems, by the elder Aldus, Venet., 1499, fol., at the end of his edition of Dioscorides. The last and best edition is Schneider's, who published the 'Alexipharmaca' in Greek and Latin, with the Scholia and copious notes, Halæ, 1792, 8vo. The 'Theriaca,' edited in the same manner, and containing also the fragments of Nicander's other poems, appeared in 8vo., Lips., 1816. The 'Theriaca' was published in the 'Cambridge Museum Criticum,' with Bentley's emendations, vol. i., p. 370, &c. There is extant a Greek paraphrase in prose of both poems (printed in Schneider's editions) by Eutechnius, of whom nothing is known, except that he has done the same to Oppian's 'Cynegetica' and 'Halieutica.'

NICANDER, KARL AUGUST, a recent Swedish poet of considerable celebrity, was born at Stregnäs, on the 20th March, 1799, and educated at the university of Upsala, where he made his literary début in 1820, first under the pseudonym 'August,' in the 'Kalender för Dame,' and almost immediately afterwards by his 'Runesvärdet, eller den förste Riddarn' (The Runic Sword, or the First Knight), a tragedy which manifested great power. His next production, which was illustrated with designs by his friend Baron von Hamilton, was that entitled 'Runor' (the Runes), a series of sixteen legendary 'romaunts,' among which that which has for its subject Erik Vasa is the most interesting. Another production of the same kind, though founded not upon northern but southern story,—namely, his 'Enzio,' an historical lyric in eleven romaunts, appeared in a collection of poems by him in 1825-6; and in each of those years he obtained a prize medal from the Swedish academy, the latter of which was for his poem on the 'Death of Tasso,'—a subject previously treated with great beauty and energy by the Russian poet Batiushkov. Admirable and touching as are the strains in which the tragic tale of 'King Enzio' are poured forth,—deep as is the pathos, rich as is the poetic colouring, pure and graceful as is the language, this piece did not become a favourite with the public. It was however translated into

* Compare Pliny, 'Hist. Nat.,' lib. viii., cap. 35. The same account of the σήψ is found also in Aristotle (*De Mirab. Auscult.*, c. 178), and in Ælian (*De Nat. Anim.*, l. xvi., c. 40).

German by Mohnike (1829), and the collection in which it appeared procured for its author the applause and patronage of the academy, which enabled him to travel and visit Italy in 1827. Of this journey the literary fruit was the poet's 'Minnen från Södern' (Recollections of the South, after a Tour through Denmark, Germany, Switzerland, and Italy). Its chief merit lies in the poetical pieces with which it is interspersed. Among his minor poetical compositions, that on 'Silence' is a piece of singular beauty and pathos. Nicander died February 7, 1839.

NICARAGUA. [CENTRAL AMERICA.]

NICCOLA DI PISA, or PISA'NO, is a celebrated name in the history of art. He was among the very earliest restorers of sculpture: he quitted the hard, dry, and mechanical manner of his predecessors, and introduced a style which, though it falls short of the antique, was based upon similar principles, and in which he displayed a vigorous mind and much feeling, if not always the most refined taste. None of his biographers have been able to ascertain the precise date either of his birth or death, but the former must have been very near the commencement of the thirteenth century, as he was greatly advanced in age, and became quite decrepid in the year 1273, after which date no certain mention of him can be traced. That he had attained to great skill in his profession in 1225 may be taken for granted, as he was in that year employed to execute the *arca* or tomb of San Domenico at Bologna, which he embellished with a series of bas-reliefs and figures truly admirable for that time. Several of these subjects are given by Cicognara, in his 'Storia della Scultura,' and many of the heads and countenances are finely expressed. This work clearly shows that Niccola had diligently studied the antique, and also that he must then have been almost in the maturity of his powers. For a description of and remarks on this masterly production, we refer to Cicognara and to Moronna's 'Pisa Illustrata.'

Niccola appears to have continued at Bologna till 1231, when he began the celebrated church of San Antonio, or Il Santo, at Padua, which acquired for him no less fame as an architect. He had previously given evidence of his skill in architecture by the church and convent of San Domenico at Bologna, which were designed by him during his residence in that city, and supposed to have been his first works of the kind. Immediately after completing the building at Padua, he was engaged to erect the church Dei Frari at Venice, and his reputation as an architect became so great that he was successively employed on many other buildings at Florence, Pistoja, Volterra, Naples, and in his native city. Among those which he executed at Florence, the most celebrated is the church and of monastery Santa Trinita, which edifice was extolled by Michel Agnolo as one of surpassing excellence for its simple grandeur and the nobleness of its proportions. He begun the cathedral of Pistoja in 1240, and likewise improved and embellished that at Volterra At Arezzo, the convent of S. Domenico,—at Viterbo, the church and convent of the Dominicans, where he did much in the way of repairs and restorations,—and at Naples, the church of Lorenzo, besides the magnificent abbey on the plain of Tagliacozzo, erected by Charles I. of Anjou (1268) in commemoration of his decisive victory over Corradino, and thence called Santa Maria della Vittoria,—testify to the repute in which his architectural talents were held and how extensively he was employed. Besides the Palazzo degli Anziani and S. Michele, among the edifices by him at Pisa the most noted is the campanile of S. Niccola, or the Augustines, which is an octangular structure externally, except at its upper story, which has sixteen sides, with as many arches springing from columns, and forming an open gallery around it, and above this is a lesser story crowned by a short spire, or rather a steep roof, where the octagonal form is resumed. The interior is circular, and forms an open well-staircase with arches resting upon columns, of which latter there are altogether four and twenty, fifteen of oriental granite, and the rest of various marbles. Moronna gives an elevation and section of this structure, but they are so wretchedly executed, that they cannot be relied upon for anything further than the general idea and shape of the design.

Another very celebrated work by him at Pisa, though of a different class, is the pulpit in the Baptistery, a hexagon supported on seven columns, there being one in the centre beneath it, besides those at the angles. It was executed by him in 1260; and in 1266 he was employed to make another for the cathedral at Sienna, which latter is considerably larger and richer, and octagonal in plan, so that instead of five, there are seven sides occupied with compartments in bas-relief, and likewise nine columns instead of seven. Had he produced nothing else, these two works alone (as to which Cicognara enters into a minute description), would suffice to establish Niccola's fame as a sculptor, and show the great perfection to which he advanced the art from what he found it in the hands of his immediate predecessors. Another work, of which the historian of Italian sculpture speaks at great length, is the representation of the Last Judgment and Inferno, in the façade of the Duomo of Orvieto, which has been generally attributed to Niccola, but is asserted by that critic to have been the production of

GIOVANNI DI PISA, the son and pupil of Niccola, who may have been born somewhere about 1235, as at the time of his death, in 1320, he is said to have been 'vecchissimo,' exceedingly old. We may at least suppose him to have been nearly twenty-five when he was invited to Perugia to erect a splendid monument to Urban IV., who died in that city in 1264. That work gave such satisfaction, that he was employed also upon the embellishments of the fountain in front of the Duomo, wherein he displayed extraordinary ability in the architecture, the sculpture, and the bronzes. Scarcely had he completed this work, when his father died, and he returned to Pisa in order to take possession of his patrimony. One of the first tasks committed to him by his fellow-citizens was that of adorning the small but celebrated church of S. Maria della Spina, one of the richest and most remarkable specimens of its peculiar Gothic style in Italy. For the façade and other parts of the exterior he executed a number of statues, bas-reliefs, and other ornaments of sculpture, and is said in one of the figures to have portrayed his father Niccola. What he there did however were merely the embellishments to a building, in which others shared with him; but it was not long before opportunity was afforded him of displaying his architectural ability on an ample scale, for in 1278 he began, and in 1783 completed, the renowned Campo Santo, or cemetery, one of the most remarkable monuments of its period, and that which, together with the adjacent cathedral, campanile, and baptistery, offers a most interesting group of studies to the architect. The edifice is of marble, and forms a cloister of sixty-two arches (five at each end and twenty-six on each side), inclosing the inner area or burial-ground; but neither this latter nor the exterior is a perfect parallelogram, the cloister being fifteen feet longer on one side than on the other, viz. 430 and 415 feet, and consequently the ends not at right angles to the sides. This defect would almost seem to have been occasioned by oversight, as it could not have been worth while to sacrifice regularity for the sake of a few feet.

After this, according to Vasari, he went to Sienna, where he made a model or design for the façade of the Duomo; this however is questionable. One of the first commissions he received after finishing the Campo Santo was from Charles I. of Anjou, who invited him to Naples, where he erected the Castel Nuovo, and built Santa Maria Novella. In 1286 he was employed to erect the high altar in the Duomo at Arezzo, an exceedingly sumptuous work, in the Tedesco style, with a profusion of figures and sculptures, all in marble. This work, and his Virgin and Child, on one side of the cathedral at Florence, are reckoned by Cicognara as his best productions; but another of great celebrity is the marble pulpit by him in the church of S. Andrea, at Pistoja, which, like that by Niccola in the Duomo at Pisa, is a hexagon supported by seven columns. He also executed many of the sculptures of the Duomo of Orvieto, where he employed various assistants and pupils, some of the latter of whom afterwards became celebrated, particularly Agostino and Agnolo di Sienna. At the instance of the Perugians, he returned to their city, and executed the mausoleum of Benedict XI. He was also invited by the citizens of Prato, in 1309, to build the Capella della Cintola, and to enlarge their Duomo. Loaded with honours and distinctions as well as years, he closed his life in his native city, and was there buried within that monument which he had himself constructed about forty years before, the Campo Santo, which for others was a burying-place, for himself a mausoleum.

NICE, the County of (*Contado di Nizza*), a province of the Sardinian dominions in Italy, is situated between the Maritime Alps and the sea, at the western extremity of the

Riviera of Genoa. It is separated on the west from France by the river Var, and on the north from the plains of Piedmont by the Col de Tende, 5887 feet above the sea, over which passes the carriage road from Nice to Turin. The river Roia, a rapid stream coming from the Col de Tende, crosses the eastern part of the county of Nice, near the borders of the former republic and now duchy of Genoa, and after a course of about 30 miles enters the sea near Ventimiglia. The greatest length of the county of Nice, from the sources of the Tinea, an affluent of the Var, in the lofty recesses of the Alps, to the sea-coast, is nearly 50 miles; and its breadth varies from 30 to 40 miles. The country appears like a section of a vast amphitheatre, the lower part of which consists of gentle hills and small valleys and plains, with a southern aspect. Being sheltered from the northern winds by the Alps, it enjoys a very genial climate, and is made productive by cultivation, especially of olives, figs, grapes, oranges, lemons, and other fruit. But the climate of Nice is not so mild in winter as that of Villafranca, Mentone, San Remo, Nervi, and other favoured spots on the Riviera of Genoa; and the lemon-tree, which in these last-mentioned places thrives in the open fields, is reared at Nice on espaliers against walls facing the south. (Foderé, *Voyage aux Alpes maritimes.*) The mountains, which are mostly barren and naked, occupy about two-thirds of the territory of Nice.

The principal articles of exportation are, oil, which is very fine, and in good years to the amount of 2,500,000 francs; silk, 160,000 francs; oranges and lemons, 75,000 francs; timber, 106,000 francs. Nice imports corn, wine, and cattle, and manufactures of various kinds. The population of the whole county is 104,000. The whole province is 'Porto franco,' that is to say, foreign goods are introduced without paying duty. (Bertolotti, *Viaggio nella Liguria marittima*, 1834.)

The principal towns are—Nizza; Sospello, 3600 inhabitants; Villafranca, with a good harbour and docks for the Sardinian navy, and a strong castle on the hill above, and 2500 inhabitants; Saorgio, in a strong position, often mentioned in the last wars between the French and Sardinian troops, has 2200 inhabitants; Tenda, at the foot of the mountain of the same name, has 2000 inhabitants.

The county of Nice, although subject to the royal constitutions or legislative code of the Sardinian monarchy, still retains some local regulations and privileges, which date from the time of its former Anjou sovereigns. It has its own senate or supreme court of justice, independent of the senates of Genoa and Turin, and having under its jurisdiction the provinces of Oneglia and S. Remo. The county of Nice is divided into fourteen mandamenti, or administrative districts, and contains eighty-seven communes.

Nice in the twelfth century was a municipal commonwealth, and allied to Pisa; but the kings of Aragon, having become masters of Provence, established their supremacy over Nice, leaving to the town however its elective consuls and its other municipal franchises, A.D. 1188. But Provence having passed from the Aragonese to the dominion of the counts of Anjou, in consequence of the marriage of Beatrix, daughter of Raymond Berlinghier IV. of Aragon with Charles of Anjou, brother of Louis IX. of France, in 1246, the county of Nice became subject to the Anjou dynasty of Provence and Naples.

During the war of the disputed succession of queen Joanna I. of Naples, the people of Nice had recourse for protection to Amadeus VII. of Savoy; and in 1402 king Ladislaus of Naples, and soon after his competitors of the house of Anjou, renounced their claims upon Nice to Amadeus VIII., duke of Savoy and prince of Piedmont. The county of Nice has remained ever since, with brief interruptions of temporary conquest, subject to the house of Savoy, under which it has attained its present state of prosperity.

The county of Nice has produced several distinguished men, among others the amiable poet Passeroni, who died at Milan at the end of the eighteenth century; the painters Brea and Vanloo: Papon, author of a valuable 'Histoire Générale de Provence;' Marshal Massena, well known in the wars of Napoleon; and the naturalist and traveller Pacho, who wrote a description of Cyrenaica and Marmarica, and died at Paris in 1828, at an early age.

The language of Nice is a dialect of the Langue d'Oc, or Provençal, but through its vicinity to and connection with Italy, Italian terminations and words have in many instances superseded those of the old language of the troubadours. It has been used by several native poets. The following is a specimen, describing a sanctuary raised on the ruins of the antient town of Cemenelium:

'Enfin, en achen luec destruc e solitari
Un mortal suspirat bastisse un santuari;
Dou era Giupiter e sent dieu ompulssant,
L'estendart de la crous s' eleva trionfant.'

The annual arrivals of vessels in the port of Nice are reckoned at about 2000, being chiefly small craft, and mostly French or Italian. (Serristori, *Saggio Statistico.*)

NICE (in Italian, *Nizza*), a town in Italy, formerly capital of an Italian county, subject to the duke of Savoy, now king of Sardinia, afterwards incorporated with the French empire, and now again subject to its former sovereign. It is on the coast of the Mediterranean, about 10 miles east of the Var, which separates Italy from France; and 92 miles south by west of Turin, and as far south-west of Genoa, in 43° 41′ N. lat. and 7° 16′ E. long.

Nice was founded by the Greeks of Massilia, and fortified by them to repress the neighbouring tribes and secure the navigation of the adjacent sea. Its name was written in Greek Νίκαια (Strabo, p. 184. Casaub.). It continued subject to the Massilians after the establishment of the Var as the boundary of Gaul and Italy, though it was within the boundary of Italy. In the middle ages it was a strong fortress. It was besieged, A.D. 1543, by the French, under François I., on the land side, and by the Turkish fleet, under Barbarossa, on the sea side. It was taken and plundered, except the citadel, which held out. The town was again taken by the French in 1691, 1706, and 1744. It was seized by the French, without resistance, in 1791, and annexed to the republic, being made the capital of the department of Alpes Maritimes. By the new arrangements of territory, in 1814-15, it reverted to Sardinia.

Nice is pleasantly situated, being bounded on the north by the Maritime Alps, and open on the south to the sea. The citadel of Mont-Albano, on a high and pointed rock, overhangs the town, and the Paglion, a mountain torrent, passes it on the west side, separating it from the suburb called La Croix de Marbre (the marble cross), or sometimes the English quarter, from the number of English who resort to it in time of peace. In this suburb the houses are painted externally in fresco, and surrounded with gardens containing standard orange and lemon trees. The town itself is divided into two parts, distinguished respectively as the old and new towns. The streets of the former are narrow; the latter is better laid out, and the houses are painted, like those of the English quarter. There are two squares, one of them surrounded with porticos, and very handsome. Adjacent to the other is a raised terrace, which serves for a defence of the town against the sea and for a public walk. On this terrace is a poorly-executed statue of Catherine Seguiran, a heroine, who assisted in the defence of Nice against the Turks. The ramparts of the town, on the land side, form another promenade. The cathedral or church of Santa Reparata is the chief public building.

The climate of Nice has been much celebrated for its mildness, but has been probably over-praised. The neighbourhood of the Alps, and the prevalence of the *Vent de Bise*, a keen searching wind, renders the air frequently very cold, and even frosty in winter and spring; and the heat in summer is excessive. It is however much resorted to by invalids and other strangers, especially English. The influx of visitors greatly augments the population of the place, which in 1824 consisted of 25,851 inhabitants (*Calendario Sardo*); but it appears to have increased considerably since, as Bertolotti (*Viaggio nella Liguria marittima*, 1834), reckons the population of Nizza at nearly 30,000. The walks and rides in the neighbourhood of the town are agreeable. There are many pleasant country-houses on the slope of the adjacent hills, and near the town are the ruins of the antient Cemenelium, now the hamlet of Cimiez. There are a theatre, baths, good inns, cafés, a public library, and agreeable society. Provisions (except game) are good and plentiful; the wine and oil are excellent. There are in the town some silk, cotton, and paper mills, a great number of oil mills, and a tobacco manufactory. Soap, liqueurs, essences, and perfumery are also made. The port, which is protected by a mole, is spacious and secure. Vessels of 300 tons can enter it. The chief trade is in silk, oranges and other fruit, and in the manufactures of the town. The roadstead would afford anchorage to a hundred vessels of the line. Nice is a bishop's see.

NICE, THE COUNCIL OF, was the first and most

important œcumenical council held in the Christian church. It was convened by the emperor Constantine, for the purpose of settling the Arian controversy, after he had in vain attempted to reconcile Arius and Alexander, the leaders of the two opposing parties in that dispute. The council met at Nicæa in Bithynia, in the year 325 A.D., and sat probably about two months. It was attended by bishops from nearly every part of the East; but few came from Europe, and scarcely any from Africa, exclusive of Egypt. According to Eusebius, there were more than 250 bishops present, besides presbyters, deacons, and others. Some writers give a larger number. The account generally followed is that of Socrates, Theodoret, and Epiphanius, who state that 318 bishops attended the council. Some account of the bishops who composed this assembly is given by Socrates, Sozomen, and Theodoret. It is uncertain who presided, but it is generally supposed that the president was Hosius, bishop of Corduba (Cordova) in Spain. Constantine himself was present at its meetings.

The chief question debated in the council of Nice was the Arian heresy. Eusebius of Cæsarea proposed a creed which the Arian party would have been willing to sign, but it was rejected by the council, and another creed was adopted as embodying the orthodox faith. The most important feature of this creed is the application of the word *consubstantial* (ὁμοούσιος) to the Son, to indicate the nature of his union with the Father; this word had been purposely omitted in the creed proposed by Eusebius. The creed agreed upon by the council was signed by all the bishops present, except two, Secundus, bishop of Ptolemais, and Theonas, bishop of Marmarica. Three others hesitated for some time, but signed at last, namely, Eusebius of Nicomedia, Theognis of Nicæa, and Maris of Chalcedon. The council excommunicated Arius, who was immediately afterwards banished by the emperor. The decision of this council had not the effect of restoring tranquillity to the Eastern church, for the Arian controversy was still warmly carried on, but it has supplied that mode of stating the doctrine of the Trinity (as far as relates to the Father and the Son), in which it has ever since been received by the orthodox. [ARIUS.]

The time for the celebration of Easter was also fixed by this council, in favour of the practice of the Western church. [EASTER.] It also decided against the schism of Meletius.

The only documents which have been handed down to us from this council are its creed, its synodical epistle, and its twenty canons. These canons contain no catalogue of the books of the Bible.

The Second Council of Nice, held in the year 786, declared the worship of images to be lawful.

(Lardner's *Credibility*, pt. ii., chap. 71, and the authorities quoted by him; Mosheim's *Ecclesiastical History*; Neander's *Kirchengeschichte*.)

NICENE CREED, THE, is one of the three creeds received by the church of England. It consists of the creed drawn up by the first council of Nice, with the addition of that part which relates to the divinity of the Holy Ghost. It was adopted in its present shape at the second general council of Constantinople, A.D. 381.

NICE'PHORUS I., emperor of Constantinople, was Logotheta, or intendant of the finances of the empire, under the reign of the empress Irene and of her son Constantine VI., in the latter part of the eighth century. Irene, having deprived her son of his eyes, usurped the throne. After reigning alone for six years a conspiracy broke out against her, headed by Nicephorus, who was proclaimed emperor, and crowned at Santa Sophia, A.D. 802. He banished Irene to the island of Lesbos, where she lived and died in a state of destitution. The troops in Asia revolted against Nicephorus, who showed himself avaricious and cruel, and proclaimed the patrician Bardanes emperor, but Nicephorus defeated and seized Bardanes, confined him to a monastery, and deprived him of his sight. The empress Irene had consented to pay an annual tribute to the Saracens, in order to stop their incursions into the territories of the empire; but Nicephorus refused to continue the payment, and wrote a message of defiance to the caliph Harun al Rashid. The caliph collected a vast army, which devastated Asia Minor, and destroyed the city of Heraclea on the coast of the Euxine. Nicephorus was obliged to sue for peace and pay tribute to the caliph. In an attack which the emperor made on the Bulgarians he was utterly defeated by them and killed, July, 811. His son Stauracius succeeded him, but reigned only six months, and was succeeded by Michael Rhangabe, master of the palace.

NICEPHORUS II. (called Phocas, but who must not be confounded with the usurper Phocas, who reigned in the beginning of the seventh century) was descended of a noble Byzantine family, and distinguished himself as a commander in the field. After the death of Romanus II., A.D. 959, his widow Theophano, who was accused of having poisoned him, reigned as guardian to her infant son, but finding herself insecure on the throne, she invited Nicephorus to come to Constantinople, and promised him her hand. Nicephorus came, married Theophano, and assumed the title of Augustus, A.D. 963. He repeatedly attacked the Saracens, and drove them out of Cilicia and part of Syria. In 968, Otho I., emperor of Germany, sent an embassy to Nicephorus, who received it in an uncivil manner. [LIUTPRANDUS.] But his avarice made him unpopular, and his wife, the unprincipled Theophano, having formed an intrigue with John Zimisces, an Armenian officer, conspired with him against her husband. Zimisces, with other conspirators, was introduced at night into the bedchamber of the emperor, whom they murdered, A.D. 969.

NICEPHORUS III., called Botaniates, an old officer of some military reputation in the Byzantine army in Asia, revolted against the emperor Michael Ducas, A.D. 1078, and with a body of troops, chiefly composed of Turkish mercenaries, marched to Calchedon, upon which Michael resigned the purple, and Nicephorus was proclaimed emperor at Constantinople. Michael was sent to a monastery with the title of archbishop of Ephesus. Another aspirant to the throne, Nicephorus Bryennius, was defeated, taken prisoner, and deprived of his sight. A fresh insurrection, led by Basilacius, was likewise put down by the troops of Nicephorus under the command of Alexis Comnenus. Alexis himself, who had an hereditary claim to the throne, was soon afterwards proclaimed emperor by the soldiers. Having entered Constantinople by surprise, he seized Nicephorus and banished him to a monastery, where he died in a short time, A.D. 1081. [ALEXIS COMNENUS.]

NICEPHORUS, made patriarch of Constantinople in the year 806, warmly defended the worship of images against the Iconoclasts, and was consequently banished to a convent in Asia by the emperor Leo the Armenian, A.D. 816. He died in his retirement in the year 828, being seventy years of age. He wrote several historical and theological works: 1, 'Chronographia Brevis,' being a short chronicle of events from the beginning of the world to the time of the author's death, with the series of kings, emperors, patriarchs, bishops, &c. It was translated into Latin, and published with notes, by Father Goar, Paris, 1652. 2, 'Breviarium Historicum,' or historical abridgment from the end of Maurice's reign, A.D. 602, till the beginning of the reign of Irene and her son Constantine, A.D. 780. Father Petau published a Latin translation of it in 1616, and President Cousin has given a French translation of it in the third volume of his 'History of Constantinople.' Both the above works of Nicephorus form part of the collection of the 'Byzantine Historians.' 3, 'Stichometria Librorum Sacrorum,' or enumeration of the books of Scripture, with the number of verses in each; inserted in the eighth volume of the 'Critici Sacri.' 4, Several treatises against the Iconoclasts. 5, Seventeen canons inserted in the Collection of Councils and other 'Opuscula.' The Life of the patriarch Nicephorus, by Ignatius, a contemporary writer, has been translated into Latin, and inserted in the 'Acta Sanctorum.' Nicephorus is numbered among the saints both of the Greek and Roman church.

NICE'RATUS, a physician mentioned by Dioscorides (*Præf.*, lib. i., p. 2, ed. Spreng.) as one of the followers of Asclepiades, who attended particularly to materia medica. None of his writings remain, but his prescriptions are several times mentioned by Galen (*Opera*, ed. Kühn, t. xii., p. 634; t. xiii., pp. 87, 96, 98, 110, 180, 232, 233; t. xiv., p. 197), and once by Pliny (*Hist. Nat.*, l. xxxii., c. 31). We learn from Cælius Aurelianus (*Morb. Chron.*, l. ii., c. 5) that he wrote also on catalepsy. He flourished about the year 40 B.C.

NICE'TAS, a physician of Constantinople, supposed to have lived in the reign of Isaac Comnenus, about the middle of the eleventh century, of whom nothing is known, except that he formed the collection of surgical works that bears his name. It exists at present only in manuscript, of which there are three copies, one at Florence and two at Paris; but part of it was published at Florence, 1754, fol., with the title 'Græcorum Chirurgici Libri, Sorani unus de

Fracturarum Signis, Oribasii duo de Fractis et de Luxatis: e Collectione Nicetæ ab antiquissimo et optimo codice Florentino descripti, conversi, atque editi ab Antonio Cocchio, &c.' Perhaps he is the person to whom Theophylact's fifty-fifth letter is addressed, who is styled 'Physician to the King,' ἰατρὸς βασιλέως. (Fabr., *Bibl. Gr.*; Haller, *Bibl. Chirurg.*)

NICHE (from the Italian *nicchia*, signifying also a nook), a small recess, or concavity in the face of a wall for the purpose of containing a statue. The use of niches seems to have originated with the Romans, for scarcely any thing of the kind occurs in the architecture of the Greeks themselves, who rarely employed statues in any way as external decorations to their edifices, sculpture being so applied by them only as friezes or within pediments. In Italian architecture, on the contrary, niches are of very frequent occurrence, and often enter very largely into a design as principal features in the composition.

Niches are usually semicircular in plan, and round-headed, that is, covered by the quarter of a hollow sphere, owing to which the shadow within the concavity produces a highly beautiful curve. They are however occasionally made square in plan, in which case they are square-headed (as in the front of the National Gallery, London); but square-headed niches are sometimes made circular in plan, though round-headed ones are never made square. Niches exhibit still greater diversity in the modes of decorating them: in this country it has usually been the fashion to leave them quite plain, and, oftener than not, quite empty also; although a niche without a statue, vase, or some piece of sculpture in it, is rather a questionable feature, suggesting to the spectator the absence of the object which it is intended to receive; therefore, as has been remarked, not very much better than an empty picture-frame hung up in a room, the only thing which diminishes the impropriety being that though the frame can be hung up when the picture is provided for it, a niche must be provided first, and a statue can be placed in it afterwards at any time.

When niches are decorated they are usually placed within a square-headed panel, having architraves and other dressings like those of windows, and therefore admit of as much variety of design as windows themselves. Many Italian architects have given them columns, and thus converted them into small tabernacles (as in the upper order of the side elevations of St. Paul's), or have otherwise bestowed so much enrichment upon them that the statues within them are almost lost.

As to the relative size of niches, that must depend upon the circumstances of the design. When decorated like windows they are generally of the same dimensions as the windows themselves, if there are any in the composition; but cases may occur where it may be advisable to make a niche in the centre of a design a more important feature than any of the windows in it. On the other hand, small plain niches between windows, when the intervals between the latter are very considerable, may be employed with good effect, and so as to produce a pleasing degree of variety and contrast without confusion, and also afford the opportunity of introducing mezzanine windows over them; for instance, five windows in width below would give four such niches between those of the principal floor, and four attic or mezzanine windows above them, making nine in all for that story, which might therefore be divided off into small rooms.

NICHOLAS I., a deacon of Rome, was elected pope, mainly through the influence of the emperor Louis II., who was then at Rome, in April, A.D. 858, and was consecrated in St. Peter's church in presence of the emperor. The new pope sent legates to Constantinople to urge the emperor Michael III. to restore Ignatius to the patriarchal see, into which Photius had intruded himself, and at the same time to reclaim the dioceses of Illyricum, Apulia, Calabria, and Sicily, which the court of Constantinople had detached from the see of Rome during the schism of the Iconoclasts, and which, after that schism had been put down by the Eastern emperors, had not been restored. (Thomassin, *Discipline de l'Eglise*, vol. i.) The allegiance paid by the Roman pontiffs to Charlemagne and his successors as emperors of the West had greatly widened the breach between the Roman see and the Byzantines, and the schism of Photius completed the separation of the two churches. Nicholas excommunicated Photius, who in return, at a council assembled at Constantinople, anathematized Nicholas and his followers, asserting at the same time, that 'since the seat of the empire had been removed from Rome to Constantinople, the primacy and privileges enjoyed till then by the Roman see had become transferred unto that of the new capital.' The legates of Nicholas returned to Rome without effecting anything. In the year 865 Nicholas had the satisfaction of receiving into the bosom of the church Bogoris, king of the Bulgarians, with part of his nation. But on the other side he involved himself in a serious dispute with his former patron the emperor Louis, on account of Lotharius, king of Lorraine, having repudiated Theotberg his wife and married his concubine Waldrada. The pope had appointed the archbishops of Treves and Cologne as his legates to examine into the affair; but the legates, in a council held at Metz, A.D. 863, obtained a decision in favour of Lotharius, upon which Nicholas assembled a council at Rome, A.D. 864, in which the two archbishops were deposed, and Lotharius's divorce and marriage were declared null. The emperor Louis took the part of the archbishops, and marched with troops to Rome to oblige the pope to revoke the sentence. An affray took place in front of St. Peter's church between the soldiers of the emperor and the Pope's followers, but the emperor soon after consented to withdraw his troops. In the year 867, Basil the Macedonian, having murdered the emperor Michael, succeeded him on the throne, and shortly after restored Ignatius to the patriarchal see and banished Photius. Nicholas himself died at Rome in the same year, and was succeeded by Adrian II. Nicholas has left a number of letters upon questions of church doctrine and discipline, which are inserted in Coleti's 'Collection of Councils.'

NICHOLAS II., Gerard of Burgundy, succeeded Stephen IX. as pope, A.D. 1059. An opposite faction chose John bishop of Velletri, who took the name of Benedict X., but the council of Sutri disavowed him, and Benedict was obliged to resign his claim. Nicholas assembled a council at Rome, which passed a decree concerning the mode of electing the pope. This important decree is in the collection of councils, and also in Muratori's 'Rerum Italicarum Scriptores.' Nicholas entered into negotiations with the Normans, who had occupied Southern Italy, and bestowed on Robert Guiscard the duchy of Apulia and Calabria, as a fief of the Roman see. He died soon after, in 1061, and was succeeded by Alexander II.

NICHOLAS III., Giovanni Gaetani, of a noble Roman family, succeeded John XXI. in 1277. He prevailed on the emperor Rudolf of Habsburg, who was little acquainted with Italian affairs, to confirm the various grants of territory alleged to have been made to the see of Rome by former emperors, and the Exarchate of Ravenna among the rest. (Fontanini, *Del Dominio Temporale della Santa Chiesa*, and his controversy with Muratori on the subject.) Nicholas quarrelled with Charles of Anjou, king of Naples, and deprived him of the dignity of senator of Rome. He has been accused of nepotism, that is to say, of having enriched his nephews and other relatives. He died A.D. 1280, and was succeeded by Martin IV.

NICHOLAS IV., a Franciscan monk, and a native of Ascoli in the Marches, was raised to the papal see after the death of Honorius IV., A.D. 1288. He favoured the pretensions of Charles II. of Anjou upon the island of Sicily, and excommunicated James of Aragon and his partisans in that island. He received an embassy from a Tartar khan who promised to assist the Christians in the recovery of Palestine. Nicholas died in 1292, and was succeeded by Celestine V. Nicholas left several theological works.

NICHOLAS V., Tommaso da Sarzana, was elected pope after the death of Eugenius IV. in 1447. He soon after terminated the schism in the Western church by prevailing upon Felix V., who had been elected pope by the council of Basle in 1439, to abdicate in his favour, and thus restore peace to the Christian world: Felix did this with a good grace in the year 1449. [AMADEUS VIII.] At the same time, as if influenced by the example of the heads of the church, the sovereigns and states of Italy seemed to forget their feuds, at least for awhile, and Italy enjoyed several years of internal peace, a rare occurrence in the history of the middle ages. The pope, who was a patron of learning, availed himself of this period of repose to collect books and MSS., and to have translations made of the Greek classics and of the fathers of the Eastern church; he received and patronised learned men from various countries, and especially from Greece, at that time overpowered and devastated by the Turks; and he embellished Rome with sumptuous as

well as useful buildings. He enlarged the university, restored the bridges as well as the aqueduct of the Acqua Vergine, and founded the Vatican library. In 1450 he proclaimed a jubilee, which drew a prodigious number of strangers to Rome. In March, 1452, Frederic III. of Germany came to Rome, where he was crowned by the pope with the crown of Lombardy; after the coronation he married Leonora of Portugal, and both Frederic and his consort received the imperial crown from the hands of the pontiff. In the following year, 1453, the news of the taking of Constantinople by the Turks deeply affected Nicholas, who had urged the Christian princes to succour the Byzantines, and who now impressed with great earnestness upon the Italian and other states the necessity of giving up their mutual jealousies and forming a league for their common defence against the Ottomans. He also corresponded with Mahomet II. [MONTECASINO.] Nicholas died in March, 1455, at 57 years of age. He is one of the most distinguished individuals who have filled the Papal chair, and he was free from the charge of nepotism. He was succeeded by Calixtus III.

NICHOLS, JOHN, the printer, born 1745, died 1826, one of the most respectable, valuable, and useful men of the age in which he lived.

He was born and educated at Islington, and originally intended for the navy, but the death of a relation led his friends to change their design, and when not quite thirteen he was placed with Bowyer, who has been called the last of the really learned printers of England. He soon gained the confidence of his master, and was intrusted by him with the management of his printing-office. In 1766 he was taken into partnership by Mr. Bowyer, and Mr. Bowyer dying, in 1777, the whole business fell into his hands.

From this period may be dated the commencement of that career of literary exertion which was pursued with an ardour that was unabating to the close of his life, for the few things which he had published in the life-time of Mr. Bowyer scarcely deserve a notice. It is not our intention to enumerate all the works of which he was the author or editor as well as printer (for according to his own enumeration they had amounted, in 1812, to fifty-seven), but only those which are more prominent and celebrated.

In 1782 he published a quarto volume, entitled 'Biographical and Literary Anecdotes of William Bowyer, Printer, F.S.A., and of many of his Learned Friends,' a work which, far more than any other work of his time, and far more than any work which had appeared since the 'Athenæ Oxonienses' of Anthony Wood, abounded in biographical information at once authentic and original. This work, many years after, was recast and greatly enlarged, appearing in six octavo volumes, entitled 'Literary Anecdotes of the Eighteenth Century,' in 1812, to which two supplementary volumes were added, and they have been followed at intervals by five large octavo volumes more, of of the same kind of material, with the new title, 'Illustrations of Literary History.' These works will be the great fund on which critics in time to come will draw for accounts of the men in the eighteenth and beginning of the nineteenth centuries, just as the 'Athenæ' is the fund of biographical knowledge for the men of the sixteenth and seventeenth centuries. But after all something more is wanted than both these works supply.

We regard this as the work on which Mr. Nichols's literary reputation will chiefly rest; and next to it may be placed his 'History of the County of Leicester,' which is in six large folio volumes. This was in the course of publication from 1795 to 1811. The faithfulness with which he corrected any mistakes into which he had been led is worthy of imitation. The work is in general very exact and accurate, and the chief defect seems to be that the worthy author seems not to have known so well what might be omitted in a work of that nature, as what ought to find a place in it. To the people of the county it must be invaluable.

In 1788 he published, in two volumes quarto, 'The Progresses and Processions of Queen Elizabeth,' an original and happy conception, affording an opportunity for the introduction of much minute historical information, and much that illustrates the manners of a period on which we always look with a peculiar kind of interest.

In 1797 he published 'Illustrations of the Manners and Expenses of Antient Times in England.'

Having mentioned these, we shall forbear to notice any works of which he is rather to be considered in the light of an editor than an author, or where a large share of the labour was borne by some of his many literary friends. Few men had more friends of this description or deserved them better.

It will be seen by what has been said that the turn of Mr. Nichols's mind was to that species of literature which is called antiquarian, but which is in fact minute or refined history, dealing with equal attention with things of modern and of antient date. The same turn of mind is perceptible in two other publications of Mr. Nichols's, for such they may be regarded. The first of these was entitled by him 'Bibliotheca Topographica Britannica.' It consists of tracts in English history and topography, printed by him from originals, and extends, when the set is complete, to eight or ten quarto volumes, bound variously; and there is a Supplement, which may or may not be regarded as part of the work. The other work, which was strictly periodical, is 'The Gentleman's Magazine,' which passed, in a great measure, into the hands of Mr. Nichols in 1778, and continued under his direction till the time of his death. He greatly raised the reputation of the work, and during the more vigorous period of his management it was remarkable for the value of some of the articles which it contained, and for the preservation of a multitude of minute pieces of information, which will be valuable to the future inquirer into the literary or political history of the period.

Mr. Nichols passed a life honourable as it was useful, and happy as it was industrious; experiencing only one calamity besides such as ordinarily fall to the lot of human nature, but that a severe one,—the destruction by fire of his printing-office and warehouses, with the whole of their contents, on the 8th of February, 1808.

NI'CIAS is the name commonly given to the physician of Pyrrhus, king of Epirus, who went to Fabricius, the Roman consul, offering for a certain reward to take off his master by poison, A.U.C. 474, B.C. 280. Fabricius not only rejected his offer with indignation, but immediately sent him back to the king with notice of his treachery; and Pyrrhus, upon receiving the information, is said to have cried out, 'This is that Fabricius whom it is harder to turn aside from justice and honour than to divert the sun from its course.' (Eutropius, lib. ii., cap. 14.) Zonaras adds (*Annal.*, tom. ii., p. 50, l. 10, ed. Basil., 1557) that Nicias was put to death, and his skin used to cover the seat of a chair.

Historians (as was hinted above) are not agreed as to the traitor's name. He is called Nicias by Claudius Quadrigarius (ap. Aul. Gell., lib. iii., cap. 8) and Zonaras (tom. ii., p. 48, l. 45), and Cineas by Ælian (*Var. Hist.*, lib. xii., cap. 33). But Ammianus Marcellinus (lib. xxx., cap. i.), Valerius Antias (ap. Aul. Gell., lib. iii., cap. 8), and Valerius Maximus (lib. vi., cap. 5, § 1) tell the story of one of the friends of Pyrrhus, whom the first-named author calls Demochares, and the two others Timochares.

NICIAS. [SYRACUSE.]

NICKEL. This metal was first described by Cronstedt in 1751. For nice purposes the metal may be obtained in a state of purity by the following process:—roast the native sulphuret of nickel to expel the sulphur and oxidize the metal; dissolve the residue in a mixture of four parts of sulphuric acid and one part of nitric acid moderately diluted with water; evaporate the clear solution till crystals are formed, which are sulphate of nickel, of a fine emerald green colour; redissolve these, and separate any copper they may contain by a plate of iron, and add excess of ammonia, which dissolves the oxide of nickel and any oxide of cobalt that may be mixed with it; to the clear solution add potash dissolved in water, which throws down hydrate of nickel of a green colour, and this, after washing and drying, is to be mixed with black flux, and reduced into the metallic state by a strong heat in a wind-furnace.

The properties of nickel are, that it has a white colour with a yellowish tint; its lustre is considerable, and it is both malleable and ductile. Like iron, it is attracted by the magnet, and may, like it, be rendered magnetic at common temperatures, but it loses this power when heated to 630° Fahrenheit. The specific gravity of fused nickel is about 8·28, and by hammering it is increased to almost 9·0. It is nearly as hard as iron.

Nickel suffers little or no change by exposure to the air and moisture at common temperatures; it is very difficult of fusion, but melts at a lower temperature than iron; at a red heat it absorbs oxygen gradually from the air, and also decomposes water at this temperature. Nitric acid is the

only acid which readily acts upon nickel. Nickel occurs in meteoric iron and aërolites. [AEROLITES.]

The uses of nickel are very limited, and until within a few years it was scarcely employed at all; but it is now very usefully employed, and to a considerable extent, in forming an alloy with copper and zinc, known by the name of German silver. Its oxides impart a green colour to glass and porcelain.

The ores of nickel are few in number:—

Sulphuret of Nickel. Capillary Nickel.—This occurs in regular hexagonal capillary crystals. Primary form a rhomboid; colour brass-yellow or greyish; lustre metallic; hardness, scratches mica, and is scratched by felspar. Opaque, brittle.

It is soluble in nitric acid, and before the blow-pipe, when strongly heated, gives a malleable and metallic button.

It occurs in Wales, Cornwall, Saxony, &c.

Analysis by Arfwedson:—

Sulphur	. .	34·26
Nickel	. .	64·35
		98·61

Arseniuret of Nickel. Copper Nickel.—Occurs crystalized, botryoidal, reniform, and amorphous. Primary form a right rhombic prism; structure compact, fibrous; fracture uneven, conchoidal, splintery; hardness 5·0 to 5·5; colour yellowish and greyish red; lustre metallic. Opaque. Specific gravity 7·655.

Before the blow-pipe on charcoal emits an alliaceous smell, and melts.

It is found in Cornwall, Saxony, Bohemia, &c., and also in South America.

Analysis by Pfaff:—

Nickel	. .	48·90
Arsenic	. .	46·42
Iron	. .	0·34
Lead	. .	0·56
Sulphur	. .	0·80
		97·02

Sulpho-arseniuret of Nickel. Nickelglanz. Grey Nickel.—Occurs massive. Structure granular; fracture uneven. Easily frangible. Colour pale lead-grey. Opaque. Specific gravity 6·129.

Found in Sweden and in the Harz, &c.

Analysis of a specimen from Loos, in Nelsingland, by Berzelius, which was mixed with some mispickel:—

Nickel	. .	29·9
Arsenic	. .	43·4
Sulphur	. .	19·3
Cobalt	. .	0·9
Iron	. .	4·1
		97·6

Silicate of Nickel. Pimelite.—Occurs massive, and investing other minerals. Colour apple or yellowish green. It is earthy, dull, opaque, soft and greasy to the feel. It is infusible before the blow-pipe, but becomes of a dark-grey colour.

It is found in Sweden and the Harz.

Analysis by Klaproth:—

Silica	. .	35
Oxide of Nickel	.	15·62
Alumina	. .	5·10
Lime	. .	0·40
Magnesia	. .	2·25
Water	. .	37·91
		96·28

Arseniate of Nickel.—Occurs powdery on the surface of arseniuret of nickel, and massive. Colour greenish white and green. Opaque.

Found in Allemont, Hesse, &c.

Analysis by Stromeyer:—

Arsenic acid	. .	36·97
Oxide of Nickel	.	37·35
Water	. .	24·32
		98·64

We proceed now to the artificial compounds of nickel.

Oxygen and Nickel combine in two proportions, forming the protoxide and sesqui-oxide or peroxide.

Protoxide of Nickel may be obtained by adding potash or soda to a solution of any salt of nickel, by which a green hydrate is precipitated; this, heated to redness, loses water and becomes of a dark colour. It may also be procured by heating nitrate of nickel to redness. It is insoluble in water, readily dissolved by most acids, and yields green solutions. It is not reducible to the metallic state by heat alone, and is not attracted by the magnet. Oxide of nickel is insoluble in potash or soda, but readily dissolves in ammonia; the solution has a fine azure-blue colour, and is decomposed by potash or soda. It is the base of all the salts of nickel.

It is composed of

One equivalent of oxygen	. .	8
One equivalent of nickel	. .	28
Equivalent	.	36

Peroxide of Nickel may be obtained by adding a solution of chloride (or hypochlorite) of lime to one of nitrate of nickel, or by transmitting chlorine gas through water in which hydrate of nickel is suspended. The peroxide thus obtained is of a black colour, insoluble in dilute acids, potash, or soda. When added to a mixture of ammonia and its carbonate, azotic gas is evolved, and the peroxide, becoming protoxide, is dissolved. At a red heat it yields oxygen gas, and with hydrochloric acid gives out chlorine gas, and forms chloride of nickel.

It is composed of

One and a half equivalent of oxygen		12
One equivalent of nickel	. .	28
Equivalent	.	40

Chloride of Nickel is formed by dissolving either the protoxide or peroxide of the metal in hydrochloric acid. Its colour is a fine emerald-green; and by evaporating the solution, green filamentous crystals containing water are formed. This salt deliquesces in a moist atmosphere. When deprived of water it has a yellow colour and a micaceous appearance; it is volatile, and may be sublimed at a high temperature. The solution is decomposed by the alkalis and their carbonates, but ammonia added in excess redissolves the precipitate at first formed.

Chloride of nickel is composed of

One equivalent of chlorine	. .	
One equivalent of nickel	. .	28
Equivalent	.	64

The fluoride, bromide, and iodide of nickel are not much known, and are of but little importance.

Sulphur and Nickel combine in two proportions, forming the sulphuret and disulphuret.

Sulphuret of Nickel is prepared either by heating metallic nickel or the oxide with sulphur; or it may be procured by adding a hydrosulphate to a solution of nickel, or to a certain extent by passing hydrosulphuric acid gas into a neutral solution of nickel. The precipitated sulphuret is nearly black, dissolves in hydrochloric acid with the evolution of hydrosulphuric acid gas; the sulphuret procured in the dry way is of a greyish-yellow colour, and requires aqua regia (or nascent chlorine) for solution.

Sulphuret of nickel consists of

One equivalent of sulphur	. .	16
One equivalent of nickel	. .	28
Equivalent	.	44

Disulphuret of Nickel may be prepared by transmitting hydrogen gas over sulphate of nickel at a red heat. Its colour is lighter, and it is more fusible than the sulphuret, and consists of

One equivalent of sulphur	. .	16
Two equivalents of nickel	. .	56
Equivalent	.	72

Phosphuret of Nickel is formed by the action of phosphorus upon nickel heated to redness; the resulting compound is whitish, brittle, and is decomposed when exposed to heat and air. It is more fusible than the metal, and, according to Pelletier, is composed of 17 phosphorus + 83 nickel; while Lampadius states its composition to be 13 phosphorus + 87 nickel.

Cyanide of Nickel is prepared by adding a soluble cyanide to a solution of nickel, or when hydrocyanic acid is mixed with acetate of nickel.

Ferrocyanide of Nickel is a greyish or greenish com-

pound, which is precipitated when ferrocyanide of potassium is added to the salts of nickel.

ALLOYS OF NICKEL.—*Arsenic* readily combines with *Nickel*, and the compound remains undecomposed at a very high temperature. It does not obey the magnet.

Potassium and Nickel combine by fusion.

Antimony and Nickel form an alloy of a lead-colour.

Zinc and Nickel form a white brittle alloy, which enters into the composition of the *packfong* of the Chinese.

Tin and Nickel give rise to a white brittle alloy, which burns at a high temperature.

Iron and Cobalt unite with nickel, but the resulting alloys are but little known.

Mercury and Nickel have not been combined.

Copper, Zinc, and Nickel form a white alloy, of late years much employed under the name of German silver.

The salts of oxide of nickel are of course numerous, but we shall describe only a few of them:—

Nitrate of Nickel may be prepared by dissolving either the metal or its oxide in dilute nitric acid. The solution is of a fine green colour, and by evaporation yields a deliquescent salt, which is not applied to any particular purpose. It probably consists of 1 equivalent of nitric acid 54 + 1 equivalent of oxide of nickel 36 = 90; the crystals however contain a considerable quantity of water, but chemists are not agreed as to the exact proportion.

Sulphate of Nickel is easily procured by dissolving the oxide or hydrate in dilute sulphuric acid; a green salt is obtained, which readily crystallizes, and in two different primary forms; the cause of the difference has not been ascertained. The crystals consist of nearly

One equivalent of sulphuric acid .	40
One equivalent of oxide of nickel .	36
Seven equivalents of water . .	63
Equivalent .	139

Carbonate of nickel is an insoluble compound readily decomposed both by heat and acids.

Nickel forms double salts with potash and with ammonia.

The peculiar properties of the salts of nickel are, that they are decomposed by the alkaline carbonates, and the precipitate is redissolved by ammonia, forming a beautiful blue solution, which is decomposed by potash and soda, but not by their carbonates.

NICOBAR ISLANDS, THE, are situated in the Indian Ocean, between 6° 50′ and 9° 20′ N. lat. and 92° 50′ and 94° 10′ E. long. They consist of nine larger islands and some smaller ones, and are on that account called by the Malays Sambilang, that is, Nine Islands. The two most southern are called Great and Little Nicobar. Great Nicobar is more than twenty miles long, and eight miles across in the widest part. Little Nicobar is not half as large. Farther north are six smaller islands. The best known are Noncowry and Camorta or Nicovari, which are separated from one another by a strait, forming one of the safest harbours in India, in which ships of all sizes may ride with the greatest security, sheltered from all winds, about half a mile from shore. At its eastern entrance is the island of Trincutta. This harbour has the great advantage of two entrances from the east and west respectively, so that ships may get in and out either with a north-east or south-west monsoon. The other three islands are Katshall, Teressa, and Tillanjong. The most northern island is much further to the north, and is called Car Nicobar. The surface of these islands is hilly, and the hills in some places are rather high. They are in general covered with wood, and only a few tracts along the shores are cultivated. The impenetrable forests with which the hills are covered are considered to be the cause of the great unhealthiness of these islands to Europeans. The soil is very fertile and capable of producing all the fruits and vegetables of intertropical countries. The islands abound in cocoa-nuts, papayas, bananas, limes, tamarinds, betel-nuts, and the *mellori*, a species of bread-fruit; yams and other roots are cultivated, but rice is unknown. The mangosteen-tree and the pine-apple grow wild in the woods (Colebrooke), but their fruits are delicious. The animals are hogs, dogs, and fowls. The woods contain timber in plenty, and some of it supplies excellent materials for building or repairing ships. The sea abounds with exquisite fish, shell-fish, and turtle. Ambergris and the edible bird-nest are common, and supply the only articles of exportation; the Chinese and Malays annually visit these islands to procure them. The inhabitants probably do not exceed 3000 or 4000: if we may form a judgment from their physical appearance, they belong to the Malay race, and the ground-work of their language confirms this opinion. They erect their houses along the shore upon piles, to the height of six or eight feet above the ground, and sometimes so near the margin of the water as to admit the tide to flow under them. In the interior of the island of Great Nicobar a tribe is said to exist which differs from the other inhabitants; they are probably the aborigines, and belong to the Australian Negroes, as these people are found in many of the islands of the Indian Archipelago and in the Andaman Islands. The Danes twice tried to form a settlement in the harbour of Noncowry, in 1756 and in 1678, but they abandoned it after a few years, on account of the unhealthiness of the climate. Some missionaries remained there till 1792, but as they did not succeed in the conversion of the natives, they returned to Tranquebar.

(Hamilton; Fontana; Colebrooke, in *Asiatic Researches*, vols. ii., iii., iv.)

NICOLAI, CHRISTOPHER FREDERICK, a writer to whom German literature is greatly indebted, not only on account of what he himself contributed to it from his own pen, but also what he did for it by establishing several critical journals, and exciting the talents of others. He was born at Berlin, March 18th, 1733, where his father was a bookseller. At the age of sixteen, just as he was beginning to make some proficiency in his studies, he was obliged to abandon them, being sent to Frankfort on the Oder for the purpose of learning the bookselling trade; yet such was his eagerness for information, his love of reading, and his perseverance, that he employed every moment of leisure, his evenings, and the early part of every morning, in study, and, without other assistance than that of books, made himself a proficient in Greek, Latin, and English, and likewise acquired a knowledge of some parts of mathematics and philosophy. He was an instance of what may be accomplished by self-instruction, which, great as may be the disadvantages it has to contend with, has that in its favour which all advantages can hardly make amends for, namely, willingness and resolution to learn; while at the same time, if it occasionally may lead astray, self-instruction leads also to numerous inquiries that never present themselves to those who merely proceed along the path chalked out for them.

On his return to Berlin, in 1752, his attention to business did not interrupt his self-imposed studies, of which both English and German poetry then formed a considerable share; and in 1755 he produced his 'Letters,' wherein he impartially discussed the pretensions of the two literary sects headed by Bodmer and Gottsched. This work excited considerable attention, and led to his intimacy with Lessing and Moses Mendelsohn. After the death of his father, he withdrew himself from the business, leaving it to his brother, and determined to content himself with his own slender means, in preference to the pecuniary advantages to be reaped by sacrificing his literary leisure and enjoyments. The unexpected death however of his elder brother, in 1758, put an end to this short interval of tranquil study, he being obliged to carry on the business for the benefit of the family in general. But while on the one hand this only increased his diligence and economy of time, it led, on the other, to entering upon literary plans which he had before projected. In conjunction with Mendelsohn, he had already commenced (1757) the 'Bibliothek der Schönen Wissenschaften,' one of the earliest and best belles-lettres journals in the language, which was afterwards continued, till the end of 1805, under the title of the 'Neue Bibliothek,' &c. With Lessing and Mendelsohn he established, in 1759, the 'Briefe der Neuesten Litteratur;' and in 1765 projected the 'Allgemeine Deutsche Bibliothek,' of which periodical he continued to be editor till it reached its 107th volume. He did not contribute much to it himself, but the management alone of such a periodical, so eminently useful in its day, shows him to have been most indefatigable, as in the meanwhile, notwithstanding all his other avocations, he produced many original works. Among them are his 'Anecdotes of Frederick the Great,' 1788; a most excellent and elaborate 'Description of Berlin and Potsdam,' 3 vols., 1786; the 'Life and Opinions of Sebaldus Nothanker,' 1793, a sort of novel, which went through many editions, and was translated into English, French, Dutch, Danish, and Swedish; 'Life and Opinions of Sempronius Gundibert,' 1798, intended to set the doctrines of Kant and his disciples in a ridiculous light. Besides these, his 'Essay on the Templars,' his 'Re-

marks on the History of the Rosicrucians and Freemasons,' his 'Tour through Germany,' &c., to say nothing of a number of smaller pieces contributed by him to different journals, prove the variety of his information and the activity of his mind. He died in 1811, at the age of 78.

NICOLA'ITANS, a sect of heretics, who arose in the first century, and are mentioned with strong disapprobation in *Rev.*, ii. 6, 15. They appear, from the statements of the early writers, to have held the doctrines of the Gnostics, and to have lived impurely. It is generally supposed that 'the doctrine of the Nicolaitans' (*Rev.* ii. 15) is the same as 'the doctrine of Balaam' (v. 14), namely, 'to eat things sacrificed to idols, and to commit fornication.' Indeed some critics suppose the name Νικόλαος in this passage to be merely translated from בִּלְעָם and used symbolically, deriving the former word from νικάω and λαὸς, and the latter from the synonymous Hebrew words בָּלַע and עָם. (Robinson's *Greek Lexicon to the New Testament.*) The early writers trace the origin of this sect to Nicolas the Deacon (*Acts*, vi. 5), but some of them acquit him of holding the sentiments of the Nicolaitans, and ascribe the rise of the heresy to an improper advantage taken of some incautious expressions which he had used.

(Mosheim's *Ecc. Hist.*; Winer's *Biblisches Realwörterbuch:* Neander's *Kirchengeschichte.*)

NICOLA'US MYREPSUS (Gr., ὁ μυρεψὸς, 'the ointment-maker'), author of a work, 'De Compositione Medicamentorum,' written in Greek, but of which hitherto only a Latin translation has been published. Very little is known of the events of his life, and of this little the greater part is to be gleaned from hints and expressions scattered up and down in his own work. He is generally considered to be the last of the Greek medical writers (if indeed, as Friend says, his barbarous language deserves to be called Greek), and his date can be ascertained with tolerable precision. His work was probably compiled towards the end of the thirteenth century, A.D., as he is quoted by Petrus de Abano, who died in 1316, and also by Matthæus Sylvaticus and Franciscus de Pede Montium, both of whom were physicians to Robert king of Naples, and wrote very early in his reign, which began in 1309. He himself mentions Mesue (sec. xxxii., cap. 117), who lived in the twelfth century; Michael Angelus, who is probably the first emperor of the Palæologi, and began to reign A.D. 1260 (sec. i., cap. 295); Pope Nicolas (sec. ii., cap. 9), who seems to be the third of that name, and who died A.D. 1280; and Joannes Actuarius (called *Dominus* Joannes, sec. x., cap. 103; and *Magister* Joannes, sec. xxxii., cap. 99), who is generally supposed to have flourished in the thirteenth century. He appears to have visited or lived at Nicæa (sec. xxiv., cap. 12) and Alexandria (sec. i., cap. 241; sec. xvii., cap. 17; sec. xxiv., cap. 85), whence he is sometimes called Nicolaus *Alexandrinus;* he afterwards settled at Constantinople, where he attained the dignity of Actuarius* (Georg. Acropol.). Several passages in his work prove that he practised as a physician (sec. i., cap. 66; sec. xvii., cap. 17, &c.), and Georgius Acropolita, his contemporary, mentions him (*Hist. Byz.*, ed. Paris, fol. 1651, cap. 39, p. 34) as eminent in his profession, but as very ignorant of natural philosophy.

He was evidently a person of great piety, as appears thoroughout the whole of his work, though in many places it deserves rather to be called the most absurd superstition. He orders the patient in some places (sec. i., cap. 419, and sec. i., cap. 405) to repeat three *Paters, Credos, and Aves;* he often prescribes the baptismal water (sec. vii., cap. 6; sec. xiv., cap. 8, &c.) as a powerful medicine; he directs a verse out of the Psalms (sec. i., cap. 405) to be 'written on paper on the first day of the week before sun-rise, and to be tied on the right arm,' as a remedy against menorrhagia; and many other examples of the like or even greater absurdity might be given (sec. xxxvii., caps. 66 and 67; sec. i., cap. 405, &c.). Though a great part of the work is sensible enough, yet upon the whole it is not of much value. It consists of an immense number of medical formulæ, arranged alphabetically, and divided into forty-eight sections; it is almost entirely a compilation from other works, especially from Nicolaus Præpositus; the names of the medicines are often very much corrupted, and the author now and then falls into great mistakes from ignorance of the language of the writers whom he quotes. It was translated from the Greek by Leonhardus Fuchsius, and first published, Basil., fol. 1549; it is inserted in the second volume of the 'Medicæ Artis Principes,' Paris, ap. H. Stephanum, fol. 1567; the best edition is that published, Norimb. 1658, 8vo.

* Actuarius, Gr. Ἀκτουάριος, a title at the court of Constantinople, given apparently only to physicians, and quite distinct from the use of the word found in the earlier Latin authors. See Du Cange, '*Gloss. Græc.*,' tom. i., p. 46; and Possini, '*Gloss. ad Pachymer. Hist. Andronici,*' tom. i., p. 366, seq., and tom. ii., p. 468-9. Besides Joannes the son of Zacharias, who is better known by his title of Actuarius than by his real name, several other physicians are recorded as having arrived at this dignity.

NICOLAUS PRÆPO'SITUS, called also *Salernitanus*, was at the head of the famous medical school at Salerno about the beginning of the twelfth century, and has left behind him a treatise on the composition of medicines under the title of 'Antidotarium.' This has very often been confounded with a work on the same subject by Nicolaus Myrepsus, who indeed must either have copied a great portion of his book from Nicolaus Præpositus, or else they both drew their materials from some common source. It may be useful to mention the marks by which the two works may be distinguished. The treatise of Nicolaus Præpositus is much shorter than that of Nicolaus Myrepsus, and contains only about 140 or 150 formulæ, in alphabetical order, whereas the other consists of more than a thousand, and is divided into forty-eight sections. Nicolaus Præpositus has prefixed a short preface to his work; in Nicolaus Myrepsus there is none. Nicolaus Myrepsus often quotes several prescriptions for the same remedy; Nicolaus Præpositus never more than one. Both works begin with the '*Aurea Alexandrina*,' but the formulæ are often very different. This work is of very little value, and contains many absurdities, though, with the exception of Mesue, perhaps no work of the kind enjoyed a higher reputation during the middle ages. It has been several times reprinted; the first edition was published, Venet. 1471, fol., in the editio princeps of Mesue, to whose works it has generally been appended.

NICOLA'US DAMASCE'NUS, or Nicolas of Damascus (Νικόλαος ὁ Δαμασκηνὸς), a native of Damascus [DAMASCENUS, NICOLAUS], wrote a general history in Greek, including the reign of Herod the Great, of which Josephus gives the following character:—'For living in his kingdom and with him (Herod), he composed his history in such a way as to gratify and serve him, touching on those things only which made for his glory, and even glossing over many of his actions which were plainly unjust, and concealing them with all zeal. And wishing to make a specious excuse for the murder of Mariamne and her children, so cruelly perpetrated by the king, he tells falsehoods respecting her incontinence and the plots of the young men. And throughout his whole history he eulogises extravagantly all the king's just actions, while he zealously apologises for his crimes.' (*Antiq.*, xvi. 7, 1.) This history extended to 144 books; for Josephus refers to the 123rd and 124th. (*Antiq.*, xii. 3, 2.) The fragments of this history have been published several times. There is an appendix to the edition of Orelli, Leipzig, 1811, 8vo. Nicolaus wrote other works. A fragment of his '*Life of Augustus*' is extant, and an autobiography is attributed to him, but it is probably not genuine.

On two occasions Nicolaus appears as the advocate before Agrippa of certain Jews who were molested in the practise of their peculiar customs by the Greeks among whom they lived. (Josephus, *Antiq.*, xii. 3, 2; xvi. 2, 2.) In the year 6 B.C. he was sent by Herod on an embassy to Augustus, who had taken offence against Herod, because he had led an army into Arabia to enforce certain claims which he had upon Syllæus, the prime minister of the king of Arabia, and the real governor of the country. (Josephus, *Antiq.*, xvi. 9.) Nicolaus, having obtained an audience of the emperor, accused Syllæus and defended Herod in a skilful speech, which is given by Josephus. (*Antiq.*, xvi. 10, 8.) Syllæus was sentenced to be put to death as soon as he should have given satisfaction to Herod for the claims he had upon him. This is the account of Josephus, taken probably from the history of Nicolaus himself, who appears to have exaggerated the success of his embassy, for Syllæus neither gave any satisfaction to Herod, nor was the sentence of death executed upon him. (Josephus, *Antiq.*, xvii. 3, 2.) We find him afterwards acting as the accuser of Herod's son Antipater, when he was tried before Varus for plotting against his father's life, B.C. 4 (Josephus, *Antiq.*, xvi. 5, 4-6; *Jewish War*, i. 32, 4), and again as the advocate of Archelaus before Augustus in the dispute for the succession to Herod's kingdom, B.C. 3. (Josephus, *Antiq.*, xvii. 9, 5; xi. 3; *Jewish War*, ii. 2. 6.)

NICOLAY, BARON LUDWIG HEINRICH, born at Strasburg, December 29th, 1737, was, though not of first-rate talent, one of the most pleasing among the minor poets of Germany. His style is easy and natural, his versification flowing, and his narrative interesting. All these qualities display themselves in his 'Romantic Tales,' which, although their subjects are chiefly derived from Ariosto and Bojardo, are remodelled and treated with great originality, and manifest considerable fancy, skill in the management of the story, and truth of expression, both in the comic and serious parts. Of his abilities, both as a didactic and satiric writer, proof is afforded by his 'Poetical Epistles,' which have much of the spirit and gracefulness of Wieland, with not a little of his manner. His Fables, too, and minor Tales, though not always of his own invention, show genuine talent, and frequently no small power of humour.

Nicolay resided for the greater part of his life at St. Petersburg, where he was invited, in 1769, to undertake the office of preceptor to the grand-duke (afterwards emperor) Paul. Besides being honoured with several Russian orders, he was made director of the Imperial Academy of Sciences in 1798, which office however he afterwards resigned; and in 1801 was raised to the rank of imperial privy-counsellor. He died in 1820.

NICO'MACHUS, a physician of Stagira in Macedonia, and one of the family of the Asclepiadæ, flourished about 400 B.C., Ol. xcv. 1. He was the friend and physician of Amyntas, king of Macedonia, but is now only known as the father of Aristotle. (Ammonius, and Diogenes Laertius, in *Vita Aristot.*; Suidas, in voce *Nicomachus*.)

NICOME'DES (Νικομήδης), the name of several kings of Bithynia.

1. NICOMEDES I. succeeded his father Ziphœtes, B.C. 278. His succession was disputed by his brother Zibœtes; and he called in the Gauls to support his claims, B.C. 277. With their assistance he was successful; but his allies became his masters, and the whole of Asia Minor was for a long time overrun by these barbarians. [GALATIA.] He probably died about B.C. 250, and was succeeded by his eldest son Zielas.

2. NICOMEDES II., surnamed Epiphanes, succeeded his father Prusias II., B.C. 149. He accompanied his father to Rome, B.C. 167, where he appears to have been brought up under the care of the senate. (Liv., xlv. 44.) Prusias becoming jealous of the popularity of his son, and anxious to secure the succession to his younger children, formed a plan for his assassination; but Nicomedes, having gained intelligence of his purpose, deprived his father of the throne, and subsequently put him to death.

Nicomedes remained during the whole of his long reign a faithful ally, or rather obedient subject, of the Romans. He assisted the Romans in their war with Aristonicus, brother of Attalus, king of Pergamus, B.C. 131; and he was applied to by Marius for assistance during the Cimbrian war, about B.C. 103. During the latter part of his reign, he was involved in a war with Mithridates, of which an account is given in the life of that monarch. [MITHRIDATES VI., vol. xv., p. 289.]



Coin of Nicomedes II.

British Museum. Actual Size. Silver.

3. NICOMEDES III., surnamed Philopator, succeeded his father Nicomedes II., B.C. 91. During the first year of his reign, he was expelled from his kingdom by Mithridates, who placed upon the throne Socrates, the younger brother of Nicomedes. He was restored however to his kingdom in the following year by the Romans, who sent an army under Aquilius to support him. At the breaking out of the Mithridatic war, B.C. 88, Nicomedes took part with the Romans, but his army was completely defeated by the generals of Mithridates, near the river Amnias, in Paphlagonia (Strabo, xii., p. 562); and he himself was again expelled from his kingdom, and obliged to take refuge in Italy. At the conclusion of the Mithridatic war, B.C. 84, Bithynia was restored to Nicomedes. He died B.C. 74, without children, and left his kingdom to the Romans.

(Memnon, as quoted by Photius; Livy; Justin; Appian's *Mithridatic War*; Strabo; Clinton's *Fasti Hellenici*, vol. iii., Appendix 7, 'Kings of Bithynia.')

NICOMEDES. [CONCHOID.]

NICOMEDI'A (Νικομήδεια), a city of Bithynia, at the head of the gulf Astacenus, in the Propontis, was founded by Nicomedes I., B.C. 264. According to Pausanias, this city was originally called Astacus (v. 12, § 5); but Strabo informs us that Astacus was another city on the same gulf, which was founded by the Megarians and Athenians, and afterwards destroyed by Lysimachus; on which occasion its inhabitants were removed to Nicomedia (xii., p. 563. Casaub.).

Under the Roman emperors Nicomedia became one of the chief cities of the empire. Pausanias speaks of it as the principal city in Bithynia (v. 12, § 5); but under Diocletian, who chiefly resided there, it increased greatly in extent and populousness, and became inferior only to Rome, Alexandria, and Antioch. (Liban., *Orat.* viii., p. 203; Lactant., *De Morte Persec.*, c. 17.) It was almost entirely destroyed by an earthquake during the reign of the emperor Julian, but it was again rebuilt with great splendour and magnificence, and recovered nearly its former greatness. (Amian. Marcell., xxii. 9; xxii. 13; xvii. 7.) It is called at the present day Ismid, and is still a town of considerable importance; but it contains few remains of antiquity.

NICOSIA. [CYPRUS.]

NICOTIA'NA TABA'CUM, an annual plant, of which the leaves are used in a variety of forms and ways, and also in medicine. The dried leaves are large, long, entire, smooth, somewhat glutinous, and of a brown colour, with a peculiar stupifying odour, and an acrid, nauseous, bitter taste. The processes of maceration and partial fermentation, and admixture of different substances, render it more agreeable in the dried than in the fresh state. The analysis of tobacco shows its chief ingredients to be:—1st, a tobacco-camphor, called nicotian, or nicotianin, which crystallizes, and is solid at the ordinary temperature of the air; has a faint odour of tobacco, with a warm, bitterish, aromatic, but not acrid taste, and is not possessed of any narcotic power; if applied to the nostrils, it causes sneezing; and if a grain be taken into the stomach, it creates uneasiness and giddiness. It is called by some the acid principle of tobacco, and if such be its nature, it is most probably combined in the herb with, 2nd, nicotina, an alkaloid, which, like conia, does not exist at ordinary temperatures in a solid form, but in a fluid and volatile state, having an oily appearance.

The empyreumatic oil of tobacco appears to be formed during the destructive combustion, and does not exist naturally in the leaf, but is probably formed at the expense of the nicotina. It does not therefore exist in the infusion of tobacco, the mode of action of which differs in several respects from the other forms in which it is employed. The active part of the oil can be removed from it by washing with weak acetic acid. The products of tobacco when burnt, as in smoking, are:—carbonate of ammonia, nicotianin, empyreumatic oil, soot, and some gases.

Nicotina seems to be the formidable principle of tobacco when used in the solid form, or as an infusion; and the empyreumatic oil, when it is smoked, or when obtained by destructive distillation. The action of nicotina is highly poisonous; a quarter of a drop will kill a rabbit; one drop can destroy a dog. It is distinguished from the other alkaloids obtained from the tribe of the Solanaceæ by *not* causing dilatation of the pupil; the external application of it to the eye produces other very alarming narcotic symptoms. The tenth part of a grain put into the eye of a cat causes strong convulsions, with foaming at the mouth, quick respiration, accompanied with rattling in the throat, and rapid palpitations of the heart, which can be heard at a considerable distance, staggering, and paralysis of the hinder extremities, which symptoms disappear in an hour.

The empyreumatic oil, in the quantity even of a single drop placed on the tongue, excites convulsions and coma, without affecting the heart. It may prove fatal in two minutes.

Tobacco is a very powerful agent, the active principles

of which are extracted by water, either in the form of infusion or decoction. The local effects of tobacco-leaves, or any preparation of them, are those of an acrid substance; hence when taken internally they cause vomiting and purging, pain of the stomach and intestines, followed by inflammation and ulceration. The external application occasions irritation of the part, and, if kept long in contact with it, inflammation: snuffing the prepared powder induces sneezing and increased secretion of mucus; chewing or smoking it causes increased secretion of saliva, with diminished appetite in those unaccustomed to its use.

Besides these local effects it has a secondary action, which results from the absorption of the active principles. It is immaterial by what channel they are introduced into the circulation: the same consequences follow, and affect on the one hand the intestinal canal, the lungs, and the heart; and on the other, the nervous centres of the brain and spinal chord. The former show themselves by nausea, vomiting, purging, pain and inflammation of the stomach, and here and there of the intestines; on the lungs, by the slower, painful, and irregular respiration; and after death the tissue of the lungs is found to be thicker, more injected with blood, and accumulations or extravasation of it. The action on the heart, or probably the nerves of the heart, manifests itself by irregular, generally slower pulsations, and by the heart losing its irritability sooner than after natural death; but the chief secondary action is on the brain and spinal chord, and this succeeds the external as well as internal application of it, but most so after injection into the rectum. Giddiness, weight, and pain of the head; deafness, a feeling like intoxication, staggering, trembling, general weariness of the muscles, with convulsive contractions of them, or cramps, general insensibility, sleepiness, and death are the consequences.

Tobacco must therefore be considered as a narcotic acrid poison. Habit reconciles the system to its action when used moderately, but nothing can secure the body from its irritative property and its ultimate absorption when employed in excess or incautiously. Uncontrollable fits of sneezing have produced death, and smoking a number of pipes or cigars has also caused death. The use of an infusion as a wash to the head in ringworm, or against the itch, has produced death by absorption through the abraded surface. The greater number of fatal cases have resulted from the employment of it as an injection into the rectum, either against worms, or, by a most singular practice, in the form of smoke in the case of persons drowned, a custom which ought to be strongly censured and relinquished.

The few cases which can justify the use of so formidable an agent are those in which great relaxation of the muscles is wished, such as to reduce dislocations or hernias, or to remove obstructions in the intestines, in ileus, and similar diseases. But the utmost caution is here requisite; and an injection of uniform strength, as ordered in the 'Pharmacopœia,' is to be prepared, and thrown up in divided portions, under the direction and in the presence of the medical attendant. In case of over-dose, vital stimulants, such as brandy or ammonia, must be resorted to. The infusion of tobacco has been recommended as a diuretic in some cases of dropsy; but it is a dangerous remedy, and seldom employed.

Against the common use of tobacco for snuffing or smoking it is perhaps useless to declaim. Chewing it is limited in a great measure to sailors, and it were to be wished that the practice of smoking were similarly restricted. The evils which follow indulgence in these customs are not very obvious, but that injury results is in most cases certain. [ANTIDOTES; ERRHINES.]

NICOTIANIN, the principle which gives the characteristic odour to tobacco. It is a concrete oil, and may be obtained by the following process:—distil six pounds of tobacco-leaves with twice their weight of water, till half has come over. To the distilled liquor add twice its weight of water, and again distil; and this operation is to be repeated. A fatty substance will be found floating on the surface of the distilled liquid in very small quantity, and this is nicotianin.

Its properties are, that it has the smell of tobacco, and a bitterish taste. It is insoluble in water, but readily dissolves in alcohol and in æther; dilute acids do not dissolve it, but potash takes it up. By heat it is of course volatilized, and if water be present, without change. It does not appear to have been analysed.

NICOTINA, an alkali which exists in the different species of tobacco. It is procured by the action of sulphuric acid upon tobacco-leaves, and subsequent treatment with alcohol, and afterwards with lime or magnesia, and various complicated operations. Other processes have also been adopted.

Its properties are, that it crystallizes in small plates, which, by exposure to the air, absorb moisture sufficient to become a transparent colourless liquid. When cold it is nearly inodorous, but when heated it yields a vapour, the smell of which resembles that of tobacco, and is disagreeable and acrid; its taste is also disagreeable, and somewhat caustic, and remains long in the mouth; even when cooled down to 21° it retains its fluidity. Its alkaline properties are evinced by its action upon test-papers; and when heated to 212° its vapour renders turmeric paper brown. It boils at 375°, is soluble in water, æther, and almond oil; its specific gravity is 1·048. The salts which it forms with alkalis are colourless, and are usually soluble in water and alcohol, but not in æther. Virginia tobacco yields about one-tenth of its weight of nicotina, and there is no one kind which gives much more. It has not been analyzed.

NICTITATING MEMBRANE. [BIRDS.]

NIEBUHR, CARSTEN, a celebrated modern traveller, and a native of the duchy of Lauenburg, on the southern confines of Holstein, was born in the year 1733. His family had been farmers in easy circumstances, but he lost his parents early; and, through some mismanagement in the division of their property, he was so utterly deprived for a time of the means of continuing his education, that he passed several years of his youth in the condition of a mere peasant, and was even prevented from cultivating a taste for music, which had given him hopes of obtaining the situation of organist. But, in his twenty-first year, an occasion arose which elicited his natural energy of spirit, and decided the direction of his fortunes. Some legal proceedings rendering it necessary to employ a land-surveyor in his native district, he resolved to qualify himself for the office, and for this purpose applied zealously to the study of geometry. With the thirst of knowledge thus excited, being now of age to dispose of the wreck of his little patrimony, he was led to employ a portion of it in acquiring higher instruction in the mathematics, first at Hamburg, and subsequently in the university of Göttingen. Here, as his views enlarged and his pecuniary resources diminished, he gladly embraced an opportunity, in his twenty-fourth year, of entering the corps of Hanoverian engineers: but he was soon diverted from that service by an offer from the Danish government of employment in a scientific expedition to Arabia.

The idea of this enterprise, which forms the most honourable event in the reign of Frederic V. of Denmark, was suggested to his minister Count von Bernstorff, by the learned Michaëlis, for the purpose of illustrating some passages in the Old Testament; and the original project, which contemplated the mission only of a single Arabic scholar, was liberally extended by the Count to include a mathematician for purposes of astronomical and geographical observation, a naturalist, a draughtsman, and a physician. When the first of these appointments was offered to Niebuhr, he showed his conscientious character by stipulating for a delay of eighteen months, in order to improve his scientific qualifications. This period of preparation he employed chiefly in gaining practice as an astronomical observer, and also in studying Arabic for a time with Michaëlis; though, under that instructor, he made but small progress in overcoming the difficulties of a language which he afterwards learned to speak fluently in the country. He modestly declined the title of professor, not considering that his acquirements were sufficient for that distinction; and he accompanied the expedition therefore only as a lieutenant of engineers, in the capacity of mathematician or geographer, to which the Danish minister, who had received some proofs of his disinterestedness in pecuniary affairs, added the responsible office of treasurer to the mission. Its other members were Frederic Christiern von Haven, as professor of the Oriental languages, Peter Forskål as naturalist, Christiern Charles Cramer as physician, and George William Baurenfeind as painter or draughtsman. By the royal instructions for the expedition, a perfect equality was established among the five members; and they were enjoined to decide every difference of opinion regarding their course by plurality of voices, or, if votes should be equal, by lot.

The expedition sailed from Copenhagen, in January, 1761,

in a frigate of the Danish royal navy, and arrived, not without some accidents, at Constantinople; from whence, after a short residence, the travellers proceeded in a merchant vessel to Alexandria, ascended the Nile, and reached Cairo in November, 1761. Having carefully explored the pyramids and other antiquities of Lower Egypt, they crossed the desert to Mount Sinai and Suez, embarked at that port in an Arab vessel, and landed at Loheia, in Arabia Felix, the destined seat of their mission, in December, 1762. They crossed the country, mounted on asses, the usual conveyance of Mussulmans as well as Christians in Yemen, and after visiting several places of interest, finally arrived at Mocha, where the philologist Von Haven unfortunately died, in May, 1763. The surviving travellers proceeding from thence to Sana, the capital of Yemen, were favourably received by the Imaum; but they had meanwhile lost another of their number, the naturalist Forskäl, who died on the road. His companions returning to Mocha, there embarked in an English vessel for Bombay, on the voyage to which place the painter Baurenfeind expired; and at Bombay, Niebuhr had the affliction to bury the last of his fellow-travellers, the physician Cramer. The fact is admitted by Niebuhr, that his ill-fated friends persisted in living after the European manner under the burning sun of Arabia; and it may be surmised that they lost their lives through that disregard to necessary habits of abstinence for which the Danes in their tropical colonies are remarkable, even above all other northern people. Niebuhr himself, who had suffered severely from illness with the rest of his party, after their decease adopted the same diet as the natives of the countries in which he was travelling, and thenceforth enjoyed excellent health. Sailing from Bombay, he visited Persia, including the ruins of Persepolis; ascended the Euphrates; proceeded by way of Bagdad and Aleppo to the Syrian coast; embarked for Cyprus, returned from that island to the continent; saw Jerusalem and Damascus; passed through Aleppo, and over Asia Minor to Constantinople; and finally returned to Copenhagen, in November, 1767. The whole of the travels of the mission, which occupied six years, and extended over so many countries, is said, by the good management and conscientious economy of Niebuhr, who indeed defrayed every expense that could be considered personal to himself out of his own narrow income, to have cost the Danish government only the incredibly small sum of about four thousand pounds.

Niebuhr was welcomed in Denmark as he deserved. The government undertook at its charge the engraving of all the plates of his travels, which were to be presented to him as a free gift; and he was left to publish the result of his labours at his own cost and for his own profit. Resolving to commence with the 'Description of Arabia,' he printed, in the year 1772, his volume under this title, which has become the text-book of every writer, from the historian Gibbon down to the present time, who has had occasion to treat of the antient and modern aspect of that country. The depth of research, the fidelity of delineation, and the accuracy of detail which it exhibits on the geography of Arabia, and the enduring character and condition of its inhabitants, have rendered this work of Niebuhr perfectly classical. He has sometimes been compared, and the comparison is just and appropriate, with the historian of Halicarnassus: both travellers were characterised by accuracy of observation, strict veracity, and a simplicity of narrative which art alone can never attain. [HERODOTUS.] The appearance of this work was followed, in 1774-1778, by two volumes of equal merit and interest, narrating his 'Travels in Arabia and circumjacent Countries.' To these volumes it was his intention to add a third, enriched with the result of his inquiries into the state of the Mohammedan religion and Turkish empire, and containing his astronomical observations: but some causes, not sufficiently explained, delayed this publication, until a fire, which, in 1794, destroyed the king's palace at Copenhagen, and with it the original plates both of his published and inedited works, put an end to his design. This third volume was however published in 1837, owing to the liberality of the bookseller Perthes of Hamburg, and the affection of Niebuhr's family, particularly of his daughter, under the title of 'Reisebeschreibung nach Arabien und andern umliegenden Ländern:' it contains his remarks on Aleppo, his voyage to Cyprus, and his visit to Jaffa and Jerusalem, his return to Aleppo, and journey thence through Kóniyeh to Constantinople, and an abridged account of his route through Bulgaria, Wallachia, Poland, and Germany, to Denmark. (*London Geog. Journal*, vol. viii.) After the publication of the first two volumes of his travels, he contributed to a German periodical journal, among other papers, two on the 'Interior of Africa' and the 'Political and Military State of the Turkish Empire.' His principal works, which were published in German at Copenhagen, have been translated into French and Dutch, and reprinted at Amsterdam and Utrecht. Niebuhr himself likewise edited and published, in his usual generous spirit, at his own cost, the contributions to natural history (*Descriptiones Animalium* and *Flora Egyptiaco-Arabica*) of his deceased friend Forskäl, which were also among the fruits of the mission to Arabia.

Niebuhr, whose life was prolonged to a great age, survived his return from his Oriental travels for nearly half a century. He had, about 1772, some thoughts of undertaking another journey of discovery, at the instance of the Tripoline ambassador at Copenhagen, into the interior of Africa: but a happy marriage induced him to abandon this project; and, tired of military service and a residence at Copenhagen, he obtained, in 1778, a civil situation under the government at Meldorf in Holstein, to which he withdrew, and where he passed the long remainder of his existence. He did not however suffer his mind to be idle in retirement; for he maintained an extensive correspondence with the learned in several countries of Europe, and continued so active a public officer, that, at the age of seventy-two years, notwithstanding the failure of his eye-sight, he assisted in a new territorial survey ordered by the Danish government. His long services were rewarded with the cross of Danebrog and the title of counsellor of state; and when he became quite blind, the government liberally refused to accept his resignation, and appointed a friend to assist him in his duties until the end of his life, which terminated in April, 1815. A brief memoir of him in the German language, published by his son at Kiel, two years after his death, furnished the materials for an article in the 'Biographie Universelle,' from which and his works the present account has chiefly been compiled.

NIEBUHR, BARTHOLD GEORGE, was born at Copenhagen, on the 27th August, 1776. His father, Carsten Niebuhr, had returned from the East about nine years before that time, and was residing at Copenhagen as a captain of engineers; however, two years after Barthold's birth, he received the appointment of land-surveyor, which made him remove to Meldorf, a town of Dithmarsh, in Holstein, the native province of the Niebuhrs. It was here that B. G. Niebuhr spent the whole of his infancy and boyhood, living in great retirement, and necessarily contracting studious habits, as well from the absence of all outward interruptions, as because a weakly constitution, produced by a marsh-fever, had incapacitated him for the boisterous amusements of more robust children. He derived great advantages from the society of Bojes, then well known in the literary world, who came to settle at Meldorf as landvogt in the year 1781. The wife of Bojes taught him French, his father instructed him in geography, in the English language, in the elements of mathematics, and in the Latin accidence. He began to learn music in 1783, but never made any great progress in it. In other branches of knowledge so great was his proficiency that Bojes describes him as a juvenile prodigy in 1783, when Niebuhr was only seven years old, and when he was sent to the public school of the place, in 1789, he was placed at once in the first class. He also gave considerable assistance to his father about the same time in making some long calculations connected with his office of surveyor. After having been at school from Easter, 1789, to Michaelmas, 1790, he became the private pupil of the head-master, Dr. Jäger, with whom he read for an hour every day till Easter, 1794, with the exception of three months which he spent at Hamburg, in 1792, at a kind of commercial school kept by his father's friend Professor Büsch. He also received some advice with regard to the prosecution of his classical studies from the celebrated J. H. Voss, who paid occasional visits to his father, and he acknowledges with gratitude the benefit which he had derived, in common with all Germans, from Voss's excellent translations.

Carsten Niebuhr's wish was that his son should engage in some active business; he even entertained the hope for some time that his son might follow in his own footsteps, and become celebrated as an Eastern traveller. But Barthold's tendencies were from the first in favour of a studious life, and his father was unwilling to oppose his inclinations. It was resolved then that after spending two years at Kiel,

he should go to Göttingen, and study under Heyne. He had already had communication with the last-named scholar, and had collated for him some MSS. after his return from Hamburg, in 1792.

He studied at Kiel from Easter, 1794, to the spring of 1796. Here he formed an intimacy with the family of Dr. Hensler, professor of medicine, which had the greatest influence on his subsequent career. The widow of Dr. Hensler's son, a lady from Dithmarsh, was residing in his house, and Niebuhr's acquaintance with her ripened into a friendship which lasted till his death. By far the greater part of his numerous letters are addressed to her. In August, 1794, Dr. Hensler was visited by the mother and sisters of his daughter-in-law, and Niebuhr soon formed an attachment to one of the latter, Amalie Behrens, who subsequently became his first wife.

In January, 1796, Count Schimmelmann, the Danish minister of finance, proposed to Niebuhr to become his private secretary. His father accepted the offer for him, and thus Niebuhr was introduced into the best circles of his native city. His bashfulness and studious habits however rendered him unhappy in this situation, and he soon exchanged it for that of supernumerary secretary to the Royal Library, which he entered upon in May, 1797, and held till April, 1798, when he paid a visit of two months to his family in Holstein, and then sailed for England. He resided in London and Edinburgh for about a year and a half, and returned to Holstein towards the end of 1799. About the middle of April, 1800, he went to Copenhagen, and, after a stay of a few weeks, obtained the appointment of assessor in the college of commerce for the East Indian department, and of secretary and accountant to the African consulate. The income arising from this appointment enabled him to marry Amalie Behrens, in May, 1800, and he resided with her at Copenhagen till the year 1806, performing his duties with the greatest punctuality and diligence, and to the entire satisfaction of his employers. He did not however altogether neglect his literary pursuits; they formed his evening amusement, and he found time in the midst of his business avocations to give lessons to the nephew of his friend Count Schimmelmann, and to translate part of an Arabic history of the conquest of Asia. In the spring of 1803 he had to make a journey into Germany on public business connected with the administration of the Danish finances. An offer was made to Niebuhr, at the end of 1805, to enter into the service of the Prussian government, and his dissatisfaction at the prospect of having some one appointed over his head, and the advantages held out by the situation proposed to him, induced him to accept the situation of joint-director of the first bank at Berlin, with the promise of further promotion.

He arrived at the Prussian capital on the 5th October, 1806, shortly before the battle of Jena. A few days after that event he was obliged to take flight with all the other officials. He resided till April, 1807, at Memel and Königsberg, and then became one of the secretaries of the prime-minister Hardenberg, having chiefly to attend to the supply of the army then in the field. This office kept him with the head-quarters of the army till the battle of Friedland, after which he went to Riga. The provisions of the peace of Tilsit having exacted the dismissal of Hardenberg, his office was put into commission, which consisted of Von Altenstein, Von Schön, Stägemann, Von Klewitz, and Niebuhr. Upon the accession of Stein to the administration, Niebuhr was despatched to Amsterdam to negotiate a loan, and he resided there till April, 1809. In December, 1809, he was nominated privy-counsellor, and received a high appointment in the administration of the funds. This brought him to Berlin, where, and at Königsberg, he resided through the winter of 1809-10. The opposition to a financial plan of his made him however more anxious than ever to retire from public life; and after some fruitless attempts on the part of the government to retain him in office, he exchanged his public situation for the post of historiographer to the king, vacant by the death of J. Von Müller. About the same time he was elected member of the Royal Academy of Sciences.

The opening of the university of Berlin, at Michaelmas, 1810, brought forward Niebuhr as a lecturer on Roman history; and the lectures which he delivered in this and the following year were published in 1811, and contain the germs of those new combinations and discoveries for which Niebuhr will be best known to posterity. The time which he spent at Berlin, from 1810 to 1813, seems to have been one of the happiest periods of his life. He formed a small philological society, consisting of Spalding, Buttmann, Heindorf, Schleiermacher, Ancillon, Süvern, Savigny, Schmedding, and Nicolovius, and with these distinguished scholars he spent all his spare hours. He felt very acutely the loss which this society sustained in the death of Spalding (on the 7th June, 1811). How greatly Niebuhr valued his intercourse with these highly-gifted men, may be presumed from the way in which he speaks of them at the end of the preface to his History; and there can be no doubt that many valuable hints in that work were suggested to him by his friend Savigny in particular.

Niebuhr's studious life was interrupted by the war of liberation, as it was called, in 1813-14. He took an active part in these events.* He was chiefly with the head-quarters of the allied army till February, 1814, when he was again sent to Holland on public business. He returned to Berlin in the October of that year, and resided there till the summer of 1816, when he proceeded as ambassador to the court of Rome. During this residence at the capital he wrote, besides some political tracts, a biography of his father, who died in April, 1815, and some essays for the Royal Academy of Sciences, and resumed his intercourse with his philological friends. He also instructed the crown-prince of Prussia in the principles of political economy.

His wife died on the 20th June, 1815, shortly before he received his appointment as ambassador. His first intention was to take with him to Rome her sister, his friend the widow Hensler; in fact she came to Berlin for that purpose, in April, 1816, accompanied by her niece and adopted child Margaret Hensler, the orphan daughter of Christian Hensler, who had been professor of theology at Kiel, and the young lady was also to have accompanied Niebuhr to Rome. During their residence with him however he found reason to change his mind; he married Margaret Hensler before he started for Rome, and the widow returned to Holstein.

Niebuhr did not receive his final instructions till after he had been four years in Rome. By his interest however with the pope and his secretary, the Cardinal Consalvi, he contrived to bring the negotiations to a close in seven months after the arrival of his instructions: the Prussian minister, Hardenberg, went to Rome himself in February, 1821, and Niebuhr gave him the credit of completing the concordat, though his own services in the matter were fully acknowledged by his court, and he received from the king of Prussia, as a mark of his satisfaction and approbation, the order of the Red Eagle of the second class, to which the emperor of Austria added the first class decoration of the Leopold order of knighthood.

The climate of Rome had always disagreed with his wife, and as the business which had brought him to the papal court was now finished, he wrote for his recal. This was after the birth of his third daughter, in February, 1822. He was advised in the first instance to apply for leave of absence for a year, which left his return open to him. He spent part of the autumn of 1822 at Albano, and also made a journey to Tivoli. In March, 1823, he went to Naples, in order to visit his friend De Serre, who was French ambassador in that city; and after staying there till the beginning of May, set out for Berlin.

In consequence of some slight difference with the leading men in the capital, Niebuhr retired to Bonn, where a university had been recently established, and where his friend and former secretary, Brandis, was a professor. Here he was attached to the university as an adjunct professor, and gave lectures on Roman antiquities and various subjects. At the same time he availed himself of every opportunity of promoting and encouraging the labours of other scholars. It was partly with this view that he set on foot the 'Rheinisches Museum,' a philological repository, in which the shorter essays and scattered thoughts of learned men might be given to the world. The first volume of this periodical appeared in 1827, under the joint editorship of Böckh, Niebuhr, and Brandis. The new edition of the Byzantine historians, which was commenced under his direction, was intended only as a diversion, taken up to relieve his mind from the severer studies required by the revision and correction of his 'History of Rome.' He brought out the first volume of the new edition of this history early in 1827; the alterations in this edition are so numerous that it may almost be considered as a new work. The publication of the

second volume was delayed by a fire, which burned his house to the ground and consumed all the manuscript with the exception of a leaf that he happened to have lent to a friend, and it did not appear till the end of 1830. Niebuhr's sensitive mind was much affected by the Revolution which took place in Paris in the July of that year, and by the subsequent revolt of Belgium: he looked forward with the deepest anxiety to the probable consequences of those events: he expected the renewal of that devastating war which had been the result of the first French revolution; and feared that his own happy dwelling-place, by the Rhine, would be the first to suffer from the invaders. These considerations preyed upon his spirits, and he sunk under the continued agitation of mind produced by them. He died on the 2nd of January, 1831, leaving behind him several children. His family, we understand, is now settled at Kiel; one of his sons is an officer in the Prussian army.

It is difficult to conceive a more excellent and delightful person than Barthold Niebuhr appears to have been; there is no one, of whom we have read, who has combined so blameless a character and so amiable a disposition with such boundless acquirements and such brilliant intellectual qualities. His 'History of Rome' is perhaps the most original work that this age has produced. To understand what he has done in this work, we should keep in mind the state of knowledge on the subject before his time. The disjointed ruins had lain for ages in a confused heap, though there was hardly a child in Europe who was not familiar with their rude outlines, and though many a skilful and laborious workman had endeavoured to reduce them to symmetry and order. Niebuhr, by a series of combinations which will appear most surprising to those who are most capable of appreciating works of genius, succeeded in reconstructing from the scattered fragments a stately fabric, which, if it is not identical with the original structure, is at least almost perfect and complete in itself. There cannot be a greater mistake than to suppose, as some have done, that Niebuhr was a sceptic whose sole delight was to render insecure the basis of historical evidence. He has actually done more than any one that ever lived towards extracting truth and certainty from the misty and mystical legends of early tradition, and toward substituting rational conviction for irrational credulity. The great object which he proposed to himself, in all his philological speculations, was to reproduce a true image of the past by getting rid of the deceitful influence of the present. This view he often expresses in very plain terms. Thus, he says in his introductory lecture on Roman history (*Kleine Schriften*, p. 93), 'As there is nothing which Eastern nations find more difficult to conceive than the idea of a republican constitution, as the people of Hindustan cannot be induced to regard the East India Company as an association of proprietors, or in any other light than as a princess, just so is it with even the acutest of the moderns when they study ancient history, unless they have contrived, by critical and philological studies, to shake off the influence of their habitual associations.' And in a letter to Count Adam Moltke, he exclaims (*Lebensnachrichten*, ii., p. 91), 'O, how people would cherish philology did they but know how delightfully it enables us to recal to life the fairest periods of antiquity. Reading is the most trifling part of it; the chief business is to domesticate ourself in Greece and Rome at the most different periods. Would that I could write history so vividly, that I could so discriminate what is fluctuating and uncertain, and so develop what is confused and intricate, that every one, when he heard the name of a Greek of the age of Thucydides or Polybius, or a Roman of the days of Cato or Tacitus, might be able to form a clear and adequate idea of what he was.' The very existence of such a general design presumes a lively fancy and active imagination: though these are qualities often possessed by shallow and superficial persons, they are very rarely combined with that extensive and minute learning for which Niebuhr was so distinguished. The range of his acquisitions was really wonderful. He had got together a mass of statistical information relative to the modern states of Europe, which would have sufficed of itself to gain a reputation for any man; there was hardly a stray hint in the whole series of classical writers which had escaped his searching eye, and the whole of his knowledge lay before him so as to be comprehended at one glance. In the words of one of his most ardent admirers, 'While his horizon was ever widening before him, it never sunk out of sight behind him: what he possessed he always retained; what he once knew became a part of his mind, and the means and instrument of acquiring more knowledge; and he is one of the very few examples of men gifted with a memory so tenacious as to seem incapable of forgetting any thing, who at the same time have had an intellect so vigorous as in no degree to be oppressed or enfeebled by the weight of their learning, but who, on the contrary, have kept it in orderly array, and made it minister continually to the plastic energy of thought.' (*Philol. Mus.*, i., p. 271.)

Some deductions must however be made from this general eulogy. While Niebuhr's great work has been neglected or censured, with equal injustice, by persons who have been too indolent to encounter the labour of studying it or incapable of appreciating the method of critical investigation which the author has adopted, it may be doubted, on the other hand, whether many scholars, both in Germany and England, have not been too willing to acquiesce in all Niebuhr's results, to adopt whatever he has written, and sometimes even to receive as established truths assertions unsupported by evidence or directly opposed by express testimonies. Some recent German writers have indeed taken a middle course; they adopt the general views and critical method of the historian, but they find much in the details that is defective or erroneous. This appears to us to be the true spirit in which Niebuhr's work should be studied. The young students of Roman history should be told that they will prove themselves worthy disciples of Niebuhr rather by following his method than by assuming his results; it must be impressed upon them that the original authorities should in all cases be carefully sifted and compared, and that they cannot rely implicitly on the authority of their master in cases where the theory depends on philological interpretation. It cannot be denied that the ardent imagination of Niebuhr, and his power of combining and constructing, sometimes led him to form a complete theory before he had examined all the evidence; one consequence of which is, that, under the influence of his own creations, he will sometimes extract a meaning from a passage which the words do not contain, and at other times arbitrarily reject evidence when it interferes with his own hypothesis. It is true that this same power and his intuitive sagacity have sometimes enabled him to supply a link in a chain when all direct evidence is wanting, and the certainty of his conjectures in such cases is at once felt by the symmetry and consistency which they impart to the whole fabric of the theory. The writings of Savigny, the illustrious friend of the historian, also furnish examples of the certainty which historical conjecture may attain when it is founded on complete knowledge and directed by a matured judgment. It must also be remarked that Niebuhr's style is very faulty. It is generally deficient in perspicuity, and though eloquent passages and striking descriptions are found here and there, it wants that sustained dignity which we remark in the writings of J. von Müller and other distinguished historians.

Considering the long time which Niebuhr spent in public life, it is somewhat strange that he should not have been better acquainted than he seems to have been with the modern science of political economy; and he occasionally betrays very crude and ill-formed opinions on the internal polity of other countries; witness his remarks on the relative position of England and Ireland. But with all the drawbacks which the most rigorous criticism can exact, the feeling with which we contemplate his character and attainments is one of almost unmixed admiration. He was in fact a rare combination of the man of business, the scholar, and the man of genius. If he had had no other claim to celebrity, he would have deserved to be mentioned among the general linguists whose attainments have from time to time astonished the world. His father, writing in December, 1807, states that he was then acquainted with twenty languages (*Lebensnachrichten*, i., p. 30), and there is no doubt that he subsequently added to the list. No man has ever borne his faculties more meekly than Niebuhr. Though he had been trusted and honoured by a powerful sovereign, and rewarded for public services in a situation of dignity and importance, and though he was recognised as the chief of philologers in the most learned country of Europe, his habits were to the last those of a retired student, and his manners those of an unassuming domestic man. A very pleasing picture of his mode of living has been given by the late Professor Sandford, who

visited him at Bonn, in 1829 (see *Blackwood's Magazine*, for January, 1838, p. 90, &c.); a warm testimony to the benevolence of his character and the goodness of his heart is furnished by Lieber, in his 'Reminiscences of Niebuhr;' and we see the whole man, in all his relations, social, literary, and political, in the highly-interesting collection of his letters now in the course of publication (*Lebensnachrichten über Barthold Georg Niebuhr, aus Briefen desselben*, &c., Hamburg, 1838, vols. 1 and 2).

The following is a list of Niebuhr's philological works:

1. 'Römische Geschichte,' 2 vols. 8vo., Berlin, 1811. This edition was translated into English, by Mr. Walter, Lond. 1827.

2. 'Frontonis Reliquiæ, ab A. Maio primum editæ, notis variorum edidit B. G. Niebuhrius; accedunt C. Aurel. Symmachi octo Orationum Fragmenta.' Berol., 1816.

3. 'Cicero pro Fonteio et Rabirio,' 8vo., Romæ, 1820.

4. 'Flavii Merobaudis Carmina,' St. Galli, 1823, 2nd edition, Bonnæ, 1824.

5. Römische Geschichte,' Erster Theil, Berlin, 1827; Zweiter Theil, Berlin, 1830; Dritter Theil (posthumous), 1832. The two first volumes have been translated into English by J. C. Hare and Connop Thirlwall: 1st vol. Lond. 1828; 2nd edition, 1831; 2nd vol. 1832. The third volume is still untranslated. Of this translation Niebuhr himself has expressed his opinion in dedicating his 'Byzantine Historians' to the translators,—'quorum ope Historia mea Romana à Britannis prorsus ita ut eam animo concepi patrioque sermone conscripsi legitur.'

6. 'Corpus Scriptorum Historiæ Byzantinæ, editio emendatior et copiosior, consilio B. G. Niebuhrii, C. F. instituta,' &c., Bonnæ, 1828. Of this edition Niebuhr published the 'Agathias,' and joined with Bekker in publishing 'Dexippus,' 'Eunapius,' and other shorter histories, which appeared together in one volume.

7. 'Kleine Historische und Philologische Schriften, Erste Sammlung,' Bonn, 1828. This was the first volume of a collection of his shorter essays, which had appeared in the 'Transactions of the Berlin Academy' or in the 'Rheinisches Museum;' it also contained his biography of his father and his introductory lecture on Roman history. Many of these treatises have been translated into English, some of them in the 'Classical Journal' and the 'Philological Museum.' The essays 'On the Geography of Herodotus' and 'On the Scythians' have appeared in a separate form at Oxford.

Besides these works, which he published in his own name, Niebuhr has conferred a most important benefit on Roman jurisprudence by his discovery of the fragments of Gaius. [GAIUS.] He was unable to stay at Verona long enough to copy the MS. himself, and, as he says in a letter to the widow Hensler (*Lebensnachr.*, ii., p. 240), was obliged to content himself with the merit, which would soon be forgotten, of having made the discovery, not by accident, but after a diligent search. Niebuhr interested himself very much in the restoration of passages from lost writings contained in palimpsests, and in consequence became involved in a controversy with his rival discoverer, Mai, with regard to some emendations which he had proposed in certain fragments discovered by Mai, which emendations were subsequently confirmed by a MS. at Turin. Mai charged Niebuhr with having borrowed his emendations from the MS., and it was not without difficulty that Niebuhr prevailed upon the authorities at Rome to grant an *imprimatur* to his justification.

NIEMCEWICZ, JULIAN URSYN, a modern Polish writer, to whom the literature of his country is under considerable obligations for his exertions in its behalf, and for the nationality he infused into it. Neither was it as an author alone that he distinguished himself, for he took an active part in public affairs, and gave indisputable proofs of his patriotism. As nuntius of Lithuania, he displayed his political talents in the diet, 1788-92; and in 1794 became not only the military companion, but the attached friend of Koskiusko, with whom he was taken prisoner and sent to St. Petersburg, where they remained till they were liberated by the emperor Paul on his accession. He afterwards accompanied Koskiusko to the United States, where he became personally acquainted with Washington, respecting whose personal character and domestic habits he has furnished many minute particulars in his 'Krotka Wiadomosc o Zyciu Gen. Washingtona.' His poetical works are rather numerous, and consist of six books of Fables; narratives, and miscellaneous pieces (among which are translations of Milton's 'Allegro' and 'Penseroso'); and 'Spiewy Historycne,' a series of thirty-three historical songs, wherein the poet-patriot chants the heroic deeds of his countrymen. Of these historic hymns, which first appeared in 1816, and have since gone through several editions, a German version, not however including all of them, was published in 1783, by Baron F. Gaudy. His dramatic productions consist of several comedies and tragedies, some in verse and others in prose; among which may be mentioned 'Wladyslaw,' a tragedy, in five acts; 'Casimir the Great,' a prose drama, in three acts; 'Jadwiga, Queen of Poland,' an historical opera; also a translation of Racine's 'Athalie.' His prose works consist of 'Oriental Tales;' a 'History of the Reign of Sigismund III.,' 3 vols., 1819; 'Memoirs relative to the earlier History of Poland,' 3 vols., 1822; 'Lejbe i Siora' (Levi and Sarah), or Letters of two Jewish Lovers, 1825; and 'Jan y Teczyna' (John of Teczyn), an historical romance, the scene of which is laid in the court of Sigismund Augustus (sixteenth century). In the course of it many of the personages of that period are introduced, and the national manners and costume of the time are described with great minuteness.

NIE'MEN is the Polish name of a river, which by the Germans is called *Memel*, and by the Lithuanians *Niémona*. It rises in the swampy region which, between 51° and 56° N. lat., forms the watershed between the rivers which run into the Baltic and Black seas. It originates between 53° and 54° N. lat. and near 27° E. long., and runs in its upper course about 180 miles westward. At the town of Grodno it suddenly turns to the north, and continues in that direction about 100 miles. It then turns again to the west, and soon afterwards is joined, at Kowno, by the Wilia, the largest of its affluents, which flows about 180 miles in a western direction. The remainder of its course is to the west. From Grodno to its entrance into Prussia it forms the boundary-line between Russia and Poland. Its course through Prussia amounts to about fifty miles. About eight miles below Tilsit the river divides into two arms, which branch off respectively to the north-west and south-west. The northern arm, called Russ, divides again, about two miles from its mouth, into two arms, the Atmat and Skirwieck. The southern arm is called the Ghilghe. Both arms empty themselves into the Curisches Haff, a lake of fresh water separated from the Baltic by a narrow strip of land which is formed by a continual line of sand-hills. The delta included between the Russ and Ghilghe, called the island of Kaukehnen, is alluvial and of great fertility, but it is swampy towards the lake. Though impeded by shoals at several places, the river is of great importance for the exportation of the produce of the adjacent countries. Large though clumsily-made river-barges called *wittinnes* bring the produce of Lithuania (governments of Wilna and Grodno) and of a portion of Poland to Königsberg and Memel. These barges go up the Niemen to Grodno, and up the Wilia to Wilna. They bring down all kinds of corn, hemp, flax, hides, bacon, and some minor articles. All the timber exported from Memel is floated down from the interior of Russia. As the wittinnes were formerly frequently lost owing to the westerly and north-westerly gales, which prevail on the Curisches Haff, two canals have been made along the shores of the lake, by which the Ghilghe is united to the Deime, and thus to the Pregel river, on which the commercial town of Königsberg is built. These canals, which were made in the beginning of the last century at the expense and under the auspices of the countess of Truchses, then proprietor of the county of Rautenburg, are called the Little and the Great Frederick's Canal (Grosse und Kleine Friederichs Graben). The former is also known by the Lithuanian name of Greituska (the rapid river), on account of its more rapid course, and is about three miles long. The Great Frederick Canal is about 12 miles long and terminates in the Deime near Labiau. The Deime itself is chiefly an artificial canal, which was made 400 years ago, when Prussia was governed by the Knights of the Order of St. John. This canal, which extends from Labiau to Tapiau, unites the Haff to the river Pregel. In the middle of the last century an attempt was made to establish a water-communication between the Niemen and the Prypec, an affluent of the Dnieper, which runs into the Black Sea. The noble Polish family of Oginsky caused a canal to be dug in the swampy region between the Szczara, a tri-

butary of the Upper Niemen, and the Yasiolda, an affluent of the Prypec. This canal of Oginsky is more than 30 miles long, but as its dimensions are small, and both the rivers which are united by this canal are only navigable for small craft, it is not much used.

There is perhaps no river in Europe whose floods rise to such a height and whose inundations are so destructive as the Niemen. Many circumstances unite to produce this effect. Snow to the depth of from four to six feet falls every winter on the country which is drained by it; and as the course of the river in general lies from east to west, this immense quantity of snow, being dissolved in so short a time as ten or fourteen days, causes the river to rise 20 or 30 feet above its general level; and as the fall of the river is in all its extent very inconsiderable, and its current slow, the water can only be carried off in a much longer time, and hence it accumulates in its bed and inundates the adjacent lands to a distance of several miles in many places, and causes great damage.

NIEUENTYT, BERNARD, was born 10th of August, 1654, at Westgraafdyk, a village of North Holland. There are short notices of his life in Niceron (*Mémoires des Hommes Illustres*, tom. xiii., p. 356), and in the periodical entitled 'L'Europe Savante,' for April, 1719, tom. viii., p. 297, from which the following particulars are taken. His education was conducted with a view to his entering the church, of which his father was a minister; but evincing an early indifference to an ecclesiastical life, he was left by his parent to the free choice of a profession. He accordingly commenced the study both of law and physic, having previously applied himself to the study of logic, in order the more effectually 'to restrain and fix his imagination, and acquire the habit of reasoning correctly.' He appears to have excelled as a public speaker, to which circumstance, and the general amiability of his character, may be attributed his influence in the provincial states, as also in the government of the town of Purmerend, wherein he resided, and of which he was burgomaster. As a physician he is said to have been celebrated; and able and equitable as a magistrate. He was a zealous but not very able supporter of the doctrines of Descartes, and his mathematical writings, though now valueless, obtained a temporary popularity in consequence of their author being one of the first opponents of the infinitesimal calculus. His objections, which Montucla designates 'a mere tissue of absurdities,' were replied to, first by Leibnitz (*Leipzig Acts*, 1694), and afterwards by MM. Bernoulli and Herman, the latter of whom showed, to the satisfaction of mathematicians, that their adversary knew little or nothing of the calculus against which he had written so freely. A work of much greater merit was published by him at Amsterdam in 1715, in one volume 4to., entitled 'The right use of Contemplating the Works of the Creator;' the object of the author is first to convince atheists of the existence of a supreme and benevolent Creator, by contemplating the mechanism of the heavens, the structure of animals, &c.; and secondly, to remove the doubts of Deists concerning revealed religion. It was originally published in Dutch, but has passed through several editions in German, French, and English. The English editions, translated by Chamberlayne, under the title of the 'Religious Philosopher,' appeared at London in 1718-19, and 1730, in 3 vols. 8vo.

Nieuentyt died May 30, 1718, not in 1730, as stated in Hutton's Dictionary. The following are the titles of his mathematical works: 'Considerationes circa Analyseos ad Quantitates infinitè parvas applicatæ Principia, et Calculi Differentialis Usum in resolvendis Problematibus Geometricis,' Amst., 1694, 8vo.; 'Analysis Infinitorum, seu Curvilineorum Proprietatis ex Polygonorum Natura deductæ,' Amst., 1695, 4to.; 'Considerationes Secundæ circa Differentialis Principia, et Responsio ad Virum Nobilissimum G. G. Leibnitium,' Amst., 1696, 4to.; 'A Treatise upon a New Application of Tables of Sines and Tangents,' 1714 (printed in the 'Journal Littéraire de la Haye).

NIEUPORT, a fortified town in West Flanders, six miles north-west from Furnes, and eighteen miles west-south-west from Bruges, in 51° 8′ N. lat. and 2° 44′ E. long. The town stands about a mile from the sea, on the Yporlée. The port, which is only a fishing-place, consists of a narrow creek, in which vessels are left aground at low-water; this creek forms a quay about 600 feet in length outside the walls of the fort. Nieuport has water communication with Furnes, Ostende, and Bruges, by means of the Yporlée, the Yser, and the Ostend and Bruges canal. The town is regularly fortified and capable of sustaining a long siege; a great part of the surrounding district may be laid under water by means of sluices. There are upwards of 500 houses, a fine church, a chapel, a town-hall, and several hospitals. The population in 1836 amounted to 2847.

NIEUWELANDT, WILLEM VAN DEN, a Dutch author and artist, born at Antwerp in 1584, at first followed the manner of Paul Bril, whom he accompanied to Italy, but after his return, when he fixed himself at Amsterdam, he chiefly painted architectural compositions—ruins, baths, mausoleums, triumphal arches, and other subjects of that class. These works of his pencil, in which he showed how diligently he had studied the antient monuments of Rome, were eagerly sought after, and many of them were engraved. He himself also possessed considerable skill in engraving and etching.

His literary works consist of six tragedies, namely, 'Saul,' 'Claudius Domitius,' 'Nero,' 'Livia,' 'Cleopatra,' and 'Sophonisba;' all of which display talent. The 'Nero,' which was brought out at Antwerp in 1618, at the expense of the city, met with extraordinary success. He also wrote a poem entitled 'Von den Mensch' (Man, or the Vanity of the World), wherein he expatiates on the emptiness of all human pursuits. He died at Amsterdam in 1635.

NIEUWLAND, PIETER, who has already been mentioned in the account of the literature of the Netherlands (p. 161), was one of the most extraordinary men among his contemporaries and countrymen. Like Bellamy, between whom and himself there were only a very few years' difference as to the time of their deaths, as well as that of their births, he raised himself from an obscure station to literary eminence as a poet, and not as a poet alone, but also by his acquirements and labours in philosophy and science. He was born in 1764, at Diemermeer, where his father was a carpenter, and a man of some information for one in his class of life. From him he acquired some insight into arithmetic and geometry; read all the books which the house contained, and at the age of seven began to display a turn for making verses. His verses were considered by others, besides his father, as very extraordinary productions for such a mere child, and caused him to be greatly noticed by many, and especially by Bernardus De Bosch,* who was a lover of poetry, and who had himself some pretensions to be a poet. By him the boy was taken into his own house and placed under the tuition of his brother, the celebrated Jeronimo De Bosch, by whom he was instructed in Greek and Latin, in both which he soon made great proficiency, as well as in other studies. He was then sent to the Athenæum at Amsterdam, where he had Tollius and Wyttenbach for his instructors, and where, in 1780, he gave proofs of his learning and acquirements, by a dissertation on Terence, and another on the Stoic philosopher Musonius. After attending Ruhnkenius's lectures at Leyden, he became 'candidate' of philosophy, and so distinguished himself, that in 1787 the post of head-master at the school of Utrecht was offered him. In the following year he increased his fame by the publication of some of his poetical pieces, including that entitled 'Orion,' one of his noblest productions. In these, and his subsequent poems, there are abundant marks of real genius and originality, striking thoughts and ideas expressed with great power of language. Their chief defect is, that many of them possess little interest of subject, being of the class denominated 'occasional poems,' and therefore charm only by their beauties of execution. But as his translations from Anacreon are unrivalled for their sprightliness and elegance, so is his elegy on the death of his wife for its simple and touching pathos: and if their mere beauties of style can reconcile us to the insipidity and tediousness of Petrarch's amatory strains, that poem may be allowed to charm, though written not by an Italian, but a Dutchman, and though inspired, not by a fanciful platonic passion, but by so homely and old-fashioned a feeling as sincere conjugal affection. His poems, and those of Bellamy, produced a wholesome change in that species of writing: full of feeling and thought, they showed themselves eminently superior to the correct but mechanical and spiritless productions then generally received as poetry.

* He was born 1746, died 1803. He made himself first known by his poem 'De Eigenbaat' (Interest), and he began a selection from Lavater's writings, and an edition of Vondel's works, but neither of them was completed. Jeronimo, the other brother, and by far the more celebrated of the two, was also the senior, being born at Amsterdam in 1740. As a classical scholar, as a writer of Latin poetry, and as an original critic, he stood high in the learned world. He died in 1811

Nieuwland's high poetical talent was the more remarkable because combined with other talents which have generally been considered incompatible with an ardent imagination. In conjunction with Van Swinden he published a nautical almanac; and also wrote a treatise (1787) on the means of ascertaining the longitude at sea, which has been frequently reprinted. Besides this he had begun a work on navigation, of which only the first volume appeared (1792), his death preventing him from completing it. An account of his other scientific and philosophical writings may be found in his Eloge by Van Swinden. It is related of him that he possessed such quickness of apprehension as to be able to make himself master of the contents of any work by merely running over its pages. That he possessed very extraordinary mental powers and rapidity of apprehension admits of no doubt, when the extent of his studies and attainments is compared with the shortness of his life and the variety of his avocations. In 1789 he was lector in navigation and natural philosophy at Amsterdam; in 1792 he became head teacher at Leyden, in the mathematical and physical sciences; and in 1793 professor of mathematics, physics, architecture, hydraulics, and astronomy. He died on the 14th of November, 1794, about eight months after the death of his wife and child.

NIE'VRE, a department of central France, bounded on the north and north-east by that of Yonne, on the east by that of Côte d'Or, on the south-east by that of Saône et Loire, on the south by that of Allier, on the west by that of Cher, and at the north-west extremity, for a short distance, by that of Loiret. The greatest length of this department is from the north-west, on the bank of the Loire below Neuvy, to south-east, near the banks of the Tannay, 73 miles; the greatest breadth, at right angles to the length, is from the bank of the Allier, near St. Pierre-le-Moutier, to the village of St. Agnant, near Saulieu (Côte d'Or), 65 miles. The area is calculated at 2637 square miles: the population, in 1831, was 282,521; in 1836, 297,550, showing an increase in five years of 15,029 persons, or more than 5 per cent., and giving rather more than 113 inhabitants to a square mile. In size it is above the average of the French departments; but in amount and density of population, considerably below the average. It may be compared in area with the English county of Devon, which however it rather exceeds: in amount of population it falls very far below Devonshire, and scarcely equals the much smaller county of Suffolk. In density of population it falls below any English county except Cumberland and Westmoreland. Nevers, the capital, is in 47° 0′ N. lat. and 3° 10′ E. long., 133 miles in a direct line south by east of Paris, or 140 miles by the road through Fontainebleau, Montargis, and Cosne.

The heights which separate the basin of the Loire from that of the Seine traverse the department from north-west to south-east: in the south-east part they are called the mountains of Morvan, being included in the district of that name, which comprehends the eastern side of the department. [MORVAN.] This eastern portion of the department is the more rugged portion, and consists chiefly or wholly of primitive rocks, granitic or schistose; the western part is covered by beds of the secondary strata, which intervene between the red marl and the chalk: the valleys of the Allier and the Loire, in the southern extremity of the department, and the valley of the Loire, in the north-western extremity, are occupied by the supracretaceous formations.

There are quarries of granite and marble, and of sandstone suitable for grindstones: yellow-ochre and potters' clay are also procured, but the chief mineral treasures of the department are iron and coal. The department is the seventh in the order of productiveness in coal, the quantity of which raised in 1834 was 27,055 tons, and, in 1835, 30,162 tons. This quantity was raised from one pit, in connexion with which (in 1834) 400 labourers were employed, viz. 292 in the pit, and 108 without it. There were in the same year 84 iron-works, in which were 26 furnaces for making pig-iron, 153 forges for producing wrought-iron, and 71 forges for producing steel. Charcoal was the fuel chiefly used, but coal was also employed.

The principal rivers are the Loire, the Allier, and the Yonne. The Loire enters the department on the south side, and flows about 34 miles north-west by Décise and Nevers to the junction of the Allier, on the western border, a little below Nevers, and from thence along the border of the department 44 miles to below Neuvy; in all 78 miles. The Allier has no part of its course within the department, but flows for about 24 miles along the south-western and western borders, until its junction with the Loire. These two rivers are navigable throughout that part of their course which appertains to this department. The Yonne (a feeder of the Seine) rises in the mountains of Morvan, near Château Chinon, and flows north-north-west by Château Chinon, Corbigny, Tannay, and Clamécy, into the department of Yonne. Its course in this department may be estimated at 56 or 58 miles: it is not navigable.

The other rivers are all small, and are tributaries of the more important streams above mentioned. The Tannay (15 miles long), the Avron (about 40 miles long), the Accolin (32 miles long), the Nièvre (25 miles long), and the Nohain (25 miles long), join the Loire; the Bayes, the Tamnay, the Vandonesse, the Halene, the Canne, and the Landrage, join the Avron. The Cure (which has a course of 50 miles, but only part of it in this department), the Oussière, the Angnison, and the Beuvron (20 miles long), flow into the Yonne; the Chalaux flows into the Cure, and the Soray into the Beuvron.

There are several lakes or pools, but none are very large. The principal are that of Entrains, near the head of the Nohain (5 miles long, 1 or 2 miles broad), and those at the heads of the Avron and the Bayes, in the centre of the department.

The canals are, the canal lateral to the Loire from Digoin (Saône et Loire) to Briare (Loiret), of which about 36 miles are in this department; and the Nivernais Canal, extending from the Loire, at the junction of the Avron, to the Yonne below Corbigny, and thence by the channel of the Yonne to Auxerre. It is carried from the valley of the Avron to that of the Yonne by a tunnel through the intervening mountain-ridge. About 77 miles of this canal are in the department of Nièvre.

There were, in 1836, eight government roads in the department, having an aggregate length of 257 miles, namely, 214 in good repair, 17 out of repair, and 26 unfinished. The principal road is that from Paris to Lyon, which passes by Neuvy, Cosne, Pouilly, Meves, La Charité, and Nevers, all on the right bank of the Loire: from Nevers the road follows the valley of the Allier by St. Pierre le Moutier to Moulins, in the department of Allier. The road from Bourges (Cher) to Auxerre (Yonne), which crosses the Loire by the bridge at La Charité, passes through La Charité, Varzy, and Clamécy, from whence another road branches to Avallon. The road from Nevers to Auxerre passes through Premery and Montenoison, to Clamécy, where it unites with the road from Bourges. Other roads from Nevers pass, one by Château Chinon to Autun and Châlons-sur-Saône, both in the department of Saône et Loire; and the other along the valley of the Loire by Décise to Charolles and Mâcon, also in the department of Saône et Loire. The departmental roads had an aggregate length of 305 miles, of which 181 were in good repair, 2 out of repair, and 122 unfinished. The aggregate length of the bye-roads, paths, &c., amounted to 2400 miles.

The surface of the department is estimated at nearly 1,700,000 acres, of which nearly 730,000 acres are under the plough. The produce in grain is considerably below the average of France, but, from the smallness of the population, it is (combined with the growth of potatoes) sufficient for the supply of the inhabitants. The corn-land is chiefly in the western part of the department, in the valley of the Loire. The principal crop is wheat, then follow rye, with maslin or mixed corn, then oats, then barley; all these are grown to a considerable extent. The quantity of buckwheat and maize grown is but trifling, especially of buckwheat. The quantity of potatoes is considerably above the average of France, and some hemp is raised. The extent of grass-land is considerable: the meadows and other grass enclosures amount to between 160,000 and 170,000 acres, and the commons and open pasture-grounds to about 38,000 acres. The number of oxen is nearly twice the average of the French departments; they are bred here for the supply of the Paris market. The number of cows is rather below the average of the departments, unless regarded with reference to the population, when it rises considerably above the average. The number of heifers is above the average however estimated. The elevated plains of Morvan constitute the chief grazing-land. Sheep are not numerous; neither are they of good breed, though daily improvements are introduced. The long-wooled English sheep have been

naturalised in the department. The number of horses is below the average of France, even when estimated relatively to the population. Oxen are employed in the labours of the field. There is a government establishment of stallions at Corbigny. Game is abundant in the department, the streams and lakes abound in fish, and a few truffles are found.

The vineyards occupy about 24,000 acres, little more than half the average extent of the vineyards of the French departments; they are however very productive, but the wine is only of ordinary quality, except the white wine of Pouilly on the Loire, which is in good estimation. The woodlands occupy above a third of the department, chiefly in the district of Morvan. The timber is excellent, and consists chiefly of oak, hornbeam, and beech. There are abundance of wild cherry-trees, the fruit of which might be made to yield an excellent Kirschwasser. A considerable portion of the supply of firewood for Paris comes from this district: the wood is made up into large bundles or 'trains,' by twisting the branches without rope or other fastening. In this way it is floated down the Yonne, the affluents of which are pent up or opened so as to furnish just the supply of water requisite for the transit of these floating bundles, which as they descend the Yonne and the stream becomes wider are augmented by fresh accessions.

The department is divided into four arrondissements, as follows:—

		Area in sq. Miles.	Population in 1831.	Population in 1836.	No. of Communes.
Nevers,	S.W.	875	86,847	94,382	99
Château Chinon,	E.	650	58,443	61,837	58
Clamécy,	N.	570	70,381	72,334	95
Cosne,	N.W.	542	66,850	68,997	65
		2637	282,521	297,550	317

It is divided into 25 cantons or districts, each under a justice of the peace.

In the arrondissement of Nevers are—the towns of Nevers (population in 1836, 16,967) [NEVERS], Décise or Décize (pop. 2154 town, 3068 whole commune), and Pougues, all on the Loire; St. Saulge, near the head of the Canne; St. Pierre le Moutier (pop. 1545 town, 2110 whole commune) and Dorne, between the Loire and the Allier; and La Ferté Langeron, on the Allier. At La Machine near Décise are the great coal-works of the department already noticed. There are also glass-works in this neighbourhood. Pougues is a neat little place of 500 or 600 inhabitants, situated in a pleasant valley. About half a mile from the town is a mineral spring, the waters of which are of good repute in the district, and are said to resemble those of Spa in Germany. They were at one time more famous, and are said to have been visited by Henri III. of France (A.D. 1586). St. Pierre le Moutier owes its origin to the Cluniac monks, who had a monastery here up to the time of the Revolution. There is a large piece of water in the town, which contributes to its embellishment, but is considered to diminish the salubrity of the air. Guerigny, a village on the Nièvre, 7 or 8 miles north of Nevers, has large iron-works, noticed elsewhere. [NEVERS.] At the village of Fourchambault on the Loire are large iron-works, which, with their branch establishments in this and the neighbouring departments, furnish employment to more than 2000 men. Steam-power is employed, and the iron is wrought by cylinders or rollers, not hammers. (Dupin, *Forces Productives, &c., de la France.*) Wood and coal (partly converted into coke) are used at these works. There are other iron-works scarcely less important at Imphy, another village on the Loire, 5 or 6 miles above Nevers; at the village of Pont St. Ours on the Nièvre, 2 or 3 miles from Nevers; and at Raveau near La Charité on the Loire. At Pont St. Ours women are employed in some part of the work. There are other iron-works at Bezes and Uxloup in this arrondissement.

In the arrondissement of Château Chinon are—Château Chinon (pop. in 1831, 2466 for the town, or 3865 for the whole commune; in 1836, 2775 for the commune), on the Yonne; Moulins-en-Gilbert, on a branch of the Avron; Luzy, on the Halene; and La Roche Millay, on a small feeder of the Halene. Château Chinon is the chief town of the district of Morvan: it is situated on a hill, commanded by wooded hills of greater elevation in the immediate neighbourhood. The principal trade carried on is in wood, charcoal, and cattle. The other towns of the arrondissement are unimportant. At the village of Vandelesse are considerable iron-works, which in 1827 gave employment to about 60 workmen.

In the arrondissement of Clamécy are—Clamécy (pop. in 1831, 4926 town, 5539 whole commune; in 1836, 5539 for the commune) [CLAMECY], Tannay, and Morceaux, on the Yonne; Corbigny (pop. 1692 town, 2077 whole commune), on the Angnison; Corval and Varzy (pop. 1751 town, 2909 whole commune), on branches of the Soray; Entrains, near the head of the Nohain; St. Reverien, near the head of the Beuvron; and Lormes (pop. 1634 town, 2759 whole commune), between the Yonne and the Cure. At Corbigny is a government stud: at Corval, or Corvolle, is a paper-mill on the most approved principles, and at Varzy a considerable manufacture of linen. The other towns are unimportant.

In the arrondissement of Cosne are—Cosne, or Cône (pop. in 1831, 5123 town, 5987 whole commune; in 1836, 6212 commune) [COSNE], Neuvy, Pouilly (pop. 1821 town, 3071 whole commune), Meves, and La Charité (pop. 4480 town, 5086 whole commune) [CHARITÉ, LA], on the Loire; St. Amand, on the Vrille; St. Vrain, on a small stream flowing into the Vrille; Donzy (pop. 1879 town, 3566 whole commune), on the Nohain; Champlemy, near the head of one branch of the Nièvre; and Montenoison and Prémery, on the other branch of the Nièvre. Some geographers have considered Neuvy to be the Noviodunum of Cæsar's 'Commentaries,' a position which we have followed D'Anville in fixing at Nevers. Pouilly is a handsome town in a district which produces a heady wine, compared, but without reason, with Chablis. There are iron-works at Meves on the Loire, at Prémery, at Donzy, and at two or three villages round La Charité. Round St. Amand are a number of potteries, at which a coarse ware is made from sandstone, and exported to Nantes and Paris.

The population, when not otherwise distinguished, is that of the whole commune: we have followed the census of 1831.

The department of Nièvre is under the jurisdiction of the Cour Royale of Bourges, and in the circuit of the Académie Universitaire of the same city. In respect of education it is one of the most backward of the French departments; the number of those who could read and write, of the young men enrolled in the military census of 1828-29, was only 20 in every 100; little more than half the average number in France. The department constitutes the diocese of Nevers, the bishop of which is a suffragan of the archbishop of Sens and Auxerre: it is included in the fifteenth military division, the head-quarters of which are at Bourges; and sends four deputies to the chamber.

In the earliest period of the history of France the department was occupied by the Ædui, except a small portion in the north-west and north, which was included in the dominions of the Senones. These were both Celtic nations. The tract between the Ligeris (Loire) and the Elaver (Allier) was allotted to the Boii, when the latter settled in the territories of the Ædui. (Cæs. *De Bel. Gal.*, lib. i.) The Yonne was known to the Romans by the name Icauna. There were several Celtic or Roman towns within the limits of the department: Noviodunum, or Nivernum, or Nevirnum, now Nevers; Massava, now Meves, formerly written Mesves; Condate, now Cosne; and Decetia, now Decise, all on the Loire; and Alisincum, now Anizi, a village near Moulins-en Gilbert. Massava and Condate belonged to the Senones, the other towns to the Ædui. The territories of the Ædui were included in the Roman province of Lugdunensis Prima; those of the Senones in Lugdunensis Quarta. On the downfal of the Roman empire, the department fell successively into the hands of the Burgundians and the Franks. In the middle ages it constituted for the most part the county, afterwards duchy, of Nevers; and previous to the French revolution formed the province or military government of Le Nivernois or Nivernais.

NIGER, or rather NIGIR, a name which has been given till lately to a large river mentioned by antient as well as modern geographers as flowing through the interior of Libya or Central Africa. Herodotus (ii. 32) gives an interesting account of five young men of the Libyan tribe of Nasamones, which dwelt on the coast of the Greater Syrtis, who proceeded on a journey of discovery into the interior. After traversing in a southern direction the inhabited region, and next to it the country of the wild beasts, they crossed the great sandy desert in a western direction for many days, until they arrived at a country inhabited by men of low

stature, who conducted them through extensive marshes to a city built on a great river which contained crocodiles and flowed towards the rising sun. This information Herodotus derived from the Greeks of Cyrene, who had it from Etearchus, king of the Ammonii, who said that the river in question was a branch of the Egyptian Nile, an opinion in which the historian acquiesced.

Strabo seems to have known little of the interior of Africa and its rivers: he cites the opposite testimonies of Posidonius and Artemidorus, the former of whom said that the rivers of Libya were few and small, while the latter stated that they were large and numerous (p. 830).

Pliny (*Hist. Nat.*, v. 1) gives an account of the expedition into Mauritania of the Roman commander Suetonius Paulinus, who (A.D. 41) led a Roman army across the Atlas, and, after passing a desert of black sand and burnt rocks, arrived at a river called Ger, in some MSS. Niger, near which lived the Canarii, next to whom were the Perorsi, an Ethiopian tribe; and farther inland were the Pharusii, as Pliny states above in the same chapter. The Canarii inhabited the country now called Sus, in the southern part of the empire of Marocco, near Cape Nun, and opposite the Fortunate or Canary Islands; and the Perorsi dwelt to the south of them along the sea-coast. The Ger, or Niger, of Suetonius Paulinus, which he met after crossing the Atlas, must have been one of the streams which flow from the southern side of the great Atlas through the country of Tafilelt, and which lose themselves in the southern desert. One of those streams is still called Ghir, and runs through Sejelmesa. (Grüberg's *Marocco*.) Ger or Gir seems to be an old generic African appellation for river. As for the desert which Suetonius crossed before he arrived at the Ger, it could evidently not be the great desert, which spread far to the south of the Canarii, but one of the desert tracts which lay immediately south of the Atlas. Caillié describes the inhabited parts of Draha, Tafilelt, and Sejelmesa as consisting of valleys and small plains, enclosed by sterile and rocky tracts of desert country.

But besides the Ger, or Niger, of Suetonius, Pliny in several places (v. 8, 9, and viii. 21) speaks of another apparently distinct river, the Nigris of Ethiopia, which he compares with the Nile, 'swelling at the same seasons, having similar animals living in its waters, and, like the Nile, producing the calamus and the papyrus.' In his extremely confused account, which he derived from the authority of king Juba II. of Mauritania, he mixes up the Nigris and the Nile together with other rivers, as if all the waters of Central Africa formed but one water-course, which seems to have been a very prevalent notion of old. He says (v. 9) that the Nile had its origin in a mountain of Lower Mauritania, not far from the ocean; that it flowed through sandy deserts, in which it was concealed for several days; that it reappeared in a great lake in Mauritania Cæsariensis, was again hidden for twenty days in deserts, and then rose again in the sources of the Nigris, which river, separating Africa (meaning Northern Africa) from Ethiopia, flowed through the middle of Ethiopia, and became the branch of the Nile called Astapus. The same story, though without any mention of the Nigris, is alluded to by Vitruvius, Strabo, and others, and Mela (iii. 9) adds that the river at its source was called Daras, which is still the name of a river that flows along the eastern side of the southern chain of the Atlas of Marocco and through the province of the same name which lies west of Tafilelt, and is nominally subject to Marocco. The Dara or Draha has a southern course towards the desert, but its termination is unknown. There is another river, the Akassa, called also Wadi Nun, on the west side of the Adrar ridge or southern Atlas, which flows through the country of Sus in a western direction, enters the sea south of Cape Nun, and seems to correspond to the Daras or Daratus of Ptolemy. It has been supposed that the Dara and the Akassa were one river, but the Adrar ridge seems to lie between the two.

Throughout all these confused notions of the hydrography of interior Africa entertained by the antients, one constant report or tradition is apparent, namely, that of the existence of a large river south of the great desert, and flowing towards the east. It is true that Herodotus, Strabo, Pliny, and their respective authorities thought that this river flowed into the Nile, but Mela seems to have doubted this, for he says that when the river reached the middle of the continent, it was not known what became of it.

Ptolemy, who wrote later than the preceding geographers, and seems to have had better information concerning the interior of Africa, after stating that 'Libya Interior is bounded on the north by the two Mauritaniæ, and by Africa and Cyrenaica; on the east by Marmarica and by the Ethiopia which lies south of Egypt; on the south by Interior Ethiopia, in which is the country of Agisymba, and on the west by the Western Ocean from the Hesperian gulf to the frontier of Mauritania Tingitana,' proceeds to enumerate various positions on the coast of the ocean, after which he mentions the chief mountains of Libya and the streams which flow from them to the sea. He then adds, 'In the interior the two greatest rivers are the Geir and the Nigeir; the Geir unites Mount Usargula (which he places in 20° 20′ N. lat. and 33° E. long.) with the Garamantic pharanx (the name of a mountain which he has stated above to be in 10° N. lat. and 50° E. long.). A river diverges from it at 42° E. long. and 16° N. lat., and makes the lake Chelonides, of which the middle is in 49° E. long. and 20° N. lat. This river is said to be lost under ground and to reappear, forming another river, of which the western end is at 46° E. long. and 16° N. lat. The eastern part of the river forms the lake Nuba, the site of which is 50° E. long. and 15° N. lat.' The positions here assigned to the Geir and the direction of its main stream, from the Garamantic mountain to Mount Usargula, being south-east and north-west, seem to point out for its representative either the Shary of Bornou and its supposed affluent the Bahr Kulla of Browne, or perhaps the Bahr Misselad of the same traveller, called Om Teymam by Burckhardt, who says that its indigenous appellation is Gir, a large stream coming from about 10° N. lat., and flowing north-west through Wadai, west of the borders of Dar-Fur. The Misselad is supposed to flow into lake Fittre; we do not know whether any communication exists between lake Fittre and the Tschad. In fact it appears that several streams, besides the Bahr Kulla and the Bahr Misselad, all coming from the great southern range, or Mountains of the Moon, flow in a north-west direction through the countries lying between Bornou and Dar-Fur, and the Geir of Ptolemy may have been the representative of any or all of them. Linant was informed by some Takrousi pilgrims from Dar-Sille that they travelled two months on the Bahr al Abiad before they arrived at Sennaar; and that before arriving at the Abiad they followed the course of another river upwards; and that the Abiad had its rise in a country called Bahr el Losse, from which some of the waters flow towards Marok, that is to say, to the north-west.

We now come to Ptolemy's Nigeir, a name which, having been mistaken for the Latin word Niger, has added to the confusion on the subject. Nigeir is a compound of the general appellative of Geir or Gir, which is found applied to several rivers in various parts of Africa, and the prefix Ni or N', which is found in several names of the same region reported by Denham and Caillié. Ptolemy makes the Nigeir quite a distinct river from the Geir, and places it to the westward. He says that it joins the mountain Mandrus, 19° N. lat. and 14° E. long., with the mountain Thala, 10° N. lat. and 38° E. long. Its course is thereby defined as much longer and in a less oblique line to the equator than the Geir. In fact it would correspond tolerably well—allowing for the imperfection of the means of observation in antient times—with the actual direction of the course of the Joliba and that of the river of Sakkatoo, supposing that river to form a communication with lake Tschad, as Ptolemy says that the Nigeir has a divergent to the lake Libye, which he places in 16° 30′ N. lat. and 35° E long., and the words of the text seem to express that the water ran into the lake, so that the course of the Nigeir, according to Ptolemy, as well as his predecessors, was easterly, as the Joliba or Quorra actually runs for a great part of its course. 'The lake Libye,' observes a distinguished geographer, 'to which there was an easterly divergent, I strongly suspect to have been the lake Tschad, notwithstanding that the position of Libye falls 300 geographical miles north-westward of this lake, for the name of Libye favours the presumption that it was the principal lake in the interior of Libya; it was very natural that Ptolemy, like many of the moderns, should have been misinformed as to the communication of the river with that lake, and that he should have mistaken two rivers flowing from the same ridge in opposite directions, one to the Quorra and the other to the Tschad (I allude to the Sakkatoo and the Yeu rivers), for a single communication from the Quorra

to the lake.' (Leake's paper 'On the Quorra and Niger,' in the second volume of the *Journal of the Royal Geographical Society of London*, 1832, with map at the end of the volume illustrating the subject.

But Ptolemy, after all, may not have been so much misinformed with respect to a communication existing between the lake and his Nigeir, if, as is now strongly suspected, the communication really exists, though in an inverse direction from that which Ptolemy appears to have understood. It is surmised that the river Tschadda, which, at its junction with the Quorra, just above the beginning of the delta, is larger than the Quorra itself, receives an outlet from the lake somewhere about the town of Jacobah. (Captain W. Allen, R.N., *On a New Construction of a Map of a Portion of Western Africa, showing the possibility of the Rivers Yeu and Chadda being the Outlet of the Lake Chad*, in vol. viii. of the *Journal of the Geographical Society of London*, 1838; and also the *Map of West Africa*, No. 11, published by the Society for the Diffusion of Useful Knowledge.) If this surmise prove true, it would explain the statement of the Arabian geographers of the middle ages, Edrisi, Abulfeda, and Leo Africanus, who state that the Nil el Abid, or river of the negroes, flowed from east to west. The Tschadda then would be the river of the Arabian, and the Joliba, or Upper Quorra, that of the Greek and Roman geographers. Both were ignorant of the real termination of their respective streams. 'It is nevertheless remarkable that the distance laid by Ptolemy between his source of the river and the western coast is the same as that given by modern observations; that Thamondocana, one of the towns on the Nigeir, is exactly coincident with Timbuktú, as recently laid down by M. Jomard from the itinerary of M. Caillié; that the length of the course resulting from Ptolemy's positions is nearly equal to that of the Quorra as far as the mountains of Kong, with the addition of the Tschadda or Shary of Funda, and that his position of Mount Thala, at the south-east extremity of the Nigeir, is very near that in which we may suppose the Tschadda to have its origin; so that it would seem as if Ptolemy, like Sultan Bello and other modern Africans, had considered the Tschadda as a continuation of the main river, though he knew the Egyptian Nile too well to fall into the modern error of supposing the Nigeir to be a branch of the Nile. The mountains of Kong, and the passage of the river through them at right angles to their direction, formed a natural termination to the extent of the geographer's knowledge, in like manner as among ourselves the presumed, and at length the ascertained existence of those mountains, has been the chief obstacle to a belief that the river terminated in the Atlantic.' (Leake's Paper already quoted.)

The opinions established by the Arabian geographers of the middle ages of the Niger flowing westward, led Europeans to look for its æstuary in the Senegal, Gambia, and Rio Grande; but upon examination of those rivers the mistake was ascertained; and D'Anville and other geographers separated the course of the Senegal from that of the Niger, and of the latter from that of the Nile. Mungo Park was the first European who saw the great internal river of Soudan flowing towards the east, and called Joliba. He traced it in two different journeys, from Bammakoo, about ten days from its source, to Boussa, where he was unfortunately killed in 1806. Clapperton crossed the river at Boussa, on his second journey to Sakkatoo in 1826; and after his death his faithful servant Richard Lander undertook to navigate the river from Boussa to its mouth. In 1827 he proceeded from Badagry, on the coast, to Boussa, and there embarked on the river; found that it flowed in a southern direction, receiving several large rivers from the east; among others the noble Tschadda, after which the united stream passed through an opening in the Kong chain, and that after issuing from the mountains it sent off several branches both east and west towards the coast, while he himself reached the sea by the branch known till then by the name of Rio Nun.

A fuller description of the river and its banks is given under QUORRA, the object of the present article being only to elucidate the historical question whether the great river of the Libya of Herodotus, the Nigris of Pliny, the Nigeir of Ptolemy, and the Niger of modern geographers, be one and the same river with the Quorra. M. Walckenaer (*Recherches Géographiques sur l'Intérieur de l'Afrique Septentrionale*) has maintained the negative side of the question, asserting that the antients had no knowledge of Soudan, and that the Nigeir of Ptolemy was one of the rivers flowing from the Atlas. But Col. Leake has ably answered him and supported the affirmative in the paper above quoted.

NIGER, CAIUS PESCE'NNIUS, appears to have been of humble origin; but his great military talents recommended him successively to the notice of Marcus Aurelius, Commodus, and Pertinax, by whom he was employed in offices of trust and honour. He was consul together with Septimius Severus, and obtained the government of Syria.

On the murder of Pertinax, A.D. 193, the empire was exposed for sale by the Prætorian guards, and was purchased by Didius Julianus, whom the senate was compelled to acknowledge as emperor. The people however did not tamely submit to this indignity; and three generals, at the head of their respective legions, Septimius Severus, who commanded in Pannonia, Clodius Albinus, in Britain, and Pescennius Niger, in Syria, refused to acknowledge the nomination of the Prætorians, and each claimed the empire. Of these, Niger was the most popular, and his cause was warmly espoused by all the provinces of the East. But he did not possess the energy and activity of his rival Severus. Instead of hastening to Italy, where his presence was indispensable, he quietly remained at Antioch, while Severus marched to Rome, dethroned Didius, and made active preparations for prosecuting the war against him in Asia. Roused at length from his inactivity, Niger crossed over to Europe and established his head-quarters at Byzantium; but he had scarcely arrived at this place, before his troops in Asia were defeated near Cyzicus by the generals of Severus. He was soon however able to collect another army, which he commanded in person; but being defeated successively near Nicæa and at Issus, he abandoned his troops, and fled towards the Euphrates with the intention of seeking refuge among the Parthians. But before he could reach the Euphrates, he was overtaken by a detachment of the enemy, and put to death on the spot.

(Herodian, b. ii.; Spartianus, *Life of Pescennius Niger*; Aurelius Victor, *De Cæsaribus*, c. 20; Eutropius, viii. 10; Dion, *Epitome*, b. 73, 74.)



Coin of Niger.

NIGHT-JARS, the English name of those Night-Swallows vernacularly termed Goat-suckers; whence the name *Caprimulgidæ*, by which the family is generally known among ornithologists. Mr. Rennie changes the name of the European Night-Jar to *Nyctichelidon* (Night-Swallow), objecting that the name *Goat-sucker*, which it has received in all languages, and which, he thinks, has been most absurdly continued by systematic naturalists in the term *Caprimulgus*, shows the opinion of it entertained by the vulgar. Now we cannot admit this great absurdity though we entirely agree with Mr. Rennie that 'it is as impossible for the Night-Jar to suck the teats of cattle (though most birds are fond of milk), as it is for cats to suck the breath from sleeping infants, of which they are popularly accused.' If every zoological name that has not a sure foundation were to be changed, there would be no small alteration in nomenclature and not a little confusion; as it is, the perpetual change of names is quite sufficiently perplexing. Nor are we at all sure that such names as *Caprimulgus* are not of some value as showing, in connexion with a true history of the habits of the bird, how the errors and superstitions of old times have vanished before the light of modern investigation. Thus much as an apology for not changing the family name *Caprimulgidæ*.

Mr. Vigors remarks that when we search among the *Perchers* for that point where they approximate the *Owls*, we at once light upon a group, the *Caprimulgus* of Linnæus, whose general appearance and habits point out the affinity. 'The nocturnal and predatory manners of this genus,' says Mr. Vigors, 'the hawking flight, the legs feathered to the talons, the large ears and eyes, the very disk that surrounds the face, and the pectination of the external quill-feathers, observable in some of the species, the general softness of the plumage, together with its peculiarly striking colour and

markings, produce a similarity between it and the *Strix* that has attracted the eye of the common observer no less than the naturalist. The provincial names of this genus have generally a reference to this resemblance; while the earlier scientific describers of the different species have for the most part ranked them with the owls. I know not whether the singular character observable in some of the species of this family, the serrated nail of the middle toe, may not be cited as an additional proof of their approach to the *Birds of Prey*. The strong toes of the latter are lost in Caprimulgus: but a construction of similar import (for the serration of the nail appears capable of being applied to the purposes of seizure only), preserves, though faintly, the resemblance. May we not almost venture to affirm that this apparently trivial appendage is an instance of that beautiful shading by which nature softens down the extremes of her neighbouring groups—one of those minute and delicate touches by which she marks at once an affinity and a deviation? But while we may discern at a glance the general approximation of these two families, we must at the same time acknowledge that they stand in need of an intermediate link to give them a closer connection. The weakness of the bill and of the legs and feet of the *Caprimulgus* still keeps it at some distance from the *Owls*, in which the same members are comparatively strong; while the wide gape of its mouth serves to divide the families still further. A connecting link has been however supplied by an Australian group, the *Podargus* of M. Cuvier, which harmonises these discrepant characters. We have an opportunity of observing among the specimens in the collection of the Linnean Society, how far the bill of this extraordinary genus combines the different forms of that of the two genera, and how far the legs, still maintaining the characteristics of *Caprimulgus*, such as the unequal length of the toes, are related to those of *Strix* by their superior robustness. Here indeed there is a beautiful gradation of affinities. All the front toes of *Caprimulgus* are united by a connecting membrane as far as to the first joint; those of *Strix* are divided to the origin; while those of *Podargus* partake of the characters of both, in having the middle toe connected with the outer, but divided from the inner. Again, as I have already remarked, *Caprimulgus* has the nail of the middle toe dilated and serrated: *Strix* has it, generally speaking, undilated and entire at the margin; but in *Podargus* the same part displays the singular dilatation of the one and the marginal integrity of the other. It is difficult to say to which of these groups it comes nearest, until further and more accurate accounts than we at present possess of its food and economy may determine its actual situation. At present it remains osculant between the two families, and may decidedly be pronounced the immediate passage from the *Birds of Prey* to the *Perchers*.' Mr. Vigors adds in a note that he had latterly obtained accounts from actual observers of some of these *Podargi* in New Holland, stating their manners to be generally conformable to those of the *Caprimulgi*.

Mr. Vigors further observes that the union between the two families of *Caprimulgidæ* and *Hirundinidæ* in the most essential particulars, in the habits, economy, and general conformation, is too evident to the common observer, and too universally acknowledged by scientific writers, to need any further illustration. But he remarks that it is gratifying to observe, how, even in minute particulars, a gradual succession of affinities imperceptibly smooths the passage between conterminous groups; nor does he pass over without remark the circumstance of the hind toe of *Caprimulgus* being usually retractile, which enables it to place all its toes in front, in a similar position to that which they maintain in *Cypselus*, where the family of the *Hirundinidæ* terminates. He notices also the conformation of the tail in the two families as showing a similar affinity, observing that some species of *Caprimulgus*, then lately arrived from Brazil, exhibit the forked tail of *Hirundo*, one of which, indeed, the *C. psalurus* of Temminck, has this character developed to an almost disproportionate degree. 'Leaving those typical families,' continues Mr. Vigors, 'with the short bill, and taking a general survey of the tribe, we may perceive that the *Caprimulgidæ* unite themselves to the longer-billed families, by means of the Linnean *Todi*, which preserve the broad base of the bill of the latter, but lead on, by comparative length of that member, to the succeeding family of *Halcyonidæ*. If we compare the bill of the type of the last-mentioned genus, the *Todus viridis*, Linn. [MUSCICAPIDÆ, ante, p. 14], with those of *Caprimulgus* and *Halcyon* [KINGFISHERS, vol. xiii., p. 228], we shall perceive that it stands exactly midway between them in the relative proportions of strength and breadth which it bears to each. In the length also of the tail, an important character in the groups that feed on the wing, it maintains a middle station between them.' For the group which forms the immediate connection between the present family of *Todidæ* and the preceding *Caprimulgidæ*, Mr. Vigors observes that we are indebted to Dr. Horsfield, since in the depressed and broad-based bill and wide gape of *Eurylaimus* we recognise the characters which unite those families [MUSCICAPIDÆ, ante, pp. 15, 16], and Mr. Vigors refers to the valuable plates of the *Zoological Researches in Java*, as exhibiting the intimate approach of the bill of this latter genus to that of *Podargus Javanensis*. Near to *Eurylaimus*, which in the opinion of Mr. Vigors is united to *Todus* by some species now referred to the former genus, but which were originally included in the latter, he would place the genus *Eurystomus* of Vieillot [MEROPIDÆ, vol. xv., p. 118], which in the essential characters of the bill, and from all Mr. Vigors could ascertain of its general habits and economy, seems to him to bear a striking affinity to the present group. Here also the same considerations would incline him to arrange the *Calyptomena* of Sir Stamford Raffles, which differs chiefly from the groups now mentioned in its comparatively shorter bill and the singular covering of plumes that project over the upper mandible. All these and some other corresponding genera will be found, Mr. Vigors makes no doubt, on more accurate knowledge of their economy, to belong either to the present family, which is placed at the extremity of the *Fissirostres*, or to that of *Pipridæ*, which forms, in the system of Mr. Vigors, one of the aberrant groups also of the neighbouring circle of *Dentirostres*, and thus comes in contact with the *Todidæ*. Mr. Vigors admits that more extensive knowledge respecting these birds will determine the line of demarcation between them; but the general affinity by which they approach each other, at least, in continuous families, may at once, in his opinion, be decided without hesitation. ('On the Natural Affinities that connect the orders and families of Birds,' *Linn. Trans.*, vol. xv.)

Mr. Swainson (*Classification of Birds*) considers the order of *Fissirostres* to be best represented by the *Swallows* and *Goat-suckers*; observing at the same time, that the former are the most isolated; whilst the latter, above all other birds, show the nearest affinity to the owls. 'No species, indeed,' says Mr. Swainson, 'has been yet discovered which would perplex a naturalist to decide to which of these families it belonged, but that is not material; we do not uphold the injudicious theory that every one of nature's links is so perfect, or rather so well known, as to leave no unequal intervals in the series; on the contrary, we maintain that such interruptions are frequently found, and in this manner are the *Goat-suckers* detached by a slight interval from the *Owls*.' The same author remarks, that the fissirostral birds, as a whole, are peculiarly distinguished by having the powers of flight developed in the highest degree; all the energies of their nature, he observes, seem concentrated in this one perfection; for their feet are always very short, weak, and generally so imperfect as to be of use only to rest the body after flight; their food being exclusively insects captured upon the wing. 'To accomplish this, proceeds Mr. Swainson, 'nature has given to their mouth an enormous width, by which, superadded to their amazing flight, and rapidity of movement, they are almost sure to capture their prey. Who that has watched the swallow or the goat-sucker, has failed to recognise these peculiar perfections? As the nocturnal goat-suckers frequently prey upon beetles and large moths, the mouth, in such species, is defended by stiff bristles; but these appendages are rendered unnecessary to the swallows; their game consisting entirely of those little soft insects seen in the air on a summer's evening or sporting on the flowers of a sunny field. The goat-suckers choose the twilight, and catch their food precisely in the same way, excepting, indeed, that their little short feet are sometimes used for the same purpose, a most singular part of their economy, first noticed by our countryman White. Some of these nocturnal birds (*Pogardus*,* Cuv.) have a bill nearly as strong as an owl's; others are furnished with forked tails of excessive length; and one species, discovered during our researches in Brazil (*Caprimulgus diurnus*, Temm.) quits the nocturnal habits of its

* *Podargus* must be meant.

congeners, and in cloudy days may be seen, in troops of fifteen or twenty, skimming over the surface of ponds, precisely in the manner of swallows.' Mr. Swainson then remarks that the *Swallows* and the *Goat-suckers* are, in fact, connected by certain *Swifts*, for the *Balassian Swift* is described as a nocturnal bird, appearing at sunset and going to rest at sunrise; and thus he enters the family *Hirundinidæ*. [SWALLOWS.]

The *Caprimulgidæ*, according to Mr. Swainson's classification, consist of the following genera and subgenera. But it should be remembered that he states that he has thought it best not to attempt a natural arrangement, until the family is better understood.

Character of the Family.—Plumage lax, soft. Bill exceedingly small; gape enormous. Feet very short, weak; the hallux directed forwards. (Sw.)

Genus Podargus, Cuv.

Size large. The middle claw not serrated. The hallux not directed forward.

Subgenera, *Podargus* proper. Bill large, very strong; the tip and margins of the upper mandible folding over those of the lower. Culmen elevated and arched. True rictal bristles none. Tongue very thin, entire. Tarsus short. (Swainson.)

Several species of this subgenus have been found in New Holland; and we select as an example of these *Podargus humeralis*.

Description.—Variegated above with ashy brown and dirty yellow; head and sides of the back conspicuously striped with black; forehead and dorsal plumage lightly dotted and banded with white. Tessellated beneath with black stripes and approximating dirty yellow bands. Length of the body 20 inches, and of the tail 8½.

Mr. Vigors and Dr. Horsfield observe that the birds of this genus in the collection of the Linnean Society bear such a general resemblance to each other, that they felt some hesitation in describing them as different species. The careful examination of many individuals in their own country will, in the opinion of these zoologists, alone determine with certainty whether they are distinct or merely varieties of the same species from age or sex. They state however that Dr. Latham, as well as themselves, distinguished this as a species, under the name of the *Cold River Goat-sucker*, from the *Wedge-tailed Goat-sucker* (*Podargus Stanleyanus*). Mr. Swainson also cites it as a species.



Podargus humeralis.

Here we must notice an Asiatic example of [illegible]

Podargus Javanensis of Horsfield, the *Chabba-wonno* of the Javanese.

Description.—General colour ferruginous or rufous, with a tint of isabella varied by undulated transverse bands of dark brown. A collar of pale whitish isabella, variegated with two very narrow bands of deep brown, passes round the lower part of the neck, and from this collar several large, irregular, white marks are disposed in an interrupted series from the axilla to the middle of the back; on the breast and belly several white feathers are scattered. The transverse bands are strongest on the rounded tail. Feet rufous; claws blackish; bill obscure yellow and rather shining; middle toe not dentated. Length 9 inches.

Habits.—Not known. It is nocturnal and conceals itself in large forests.



Podargus Javanensis.

The other two subgenera arranged by Mr. Swainson under the genus *Podargus* are *Ægotheles*, Horsf. and Vigors, and *Nyctibius*, Vieill.

Mr. Allis has stated that the sclerotic ring of the great *Podargus* does not present the slightest appearance of distinct plates, being simply a bony ring.

M. Lesson is of opinion that *Steatornis* [GUACHARO BIRD] forms the passage between the *Caprimulgi* and the *Crows*.

Caprimulgus. (Linn.)

Bill remarkably small and weak; the sides inflexed and sometimes gaping. Tarsus short. All the toes directed forwards; the inner and outer toes equal; the middle claw pectinated. (Sw.)



Head and Foot of Goat-sucker (Caprimulgus Europæus)

Mr. Swainson subdivides the genus into the following Subgenera, *Caprimulgus*. Gape strongly bristled. Tail lengthened, rounded. Lateral toes equal. (Sw.)

We select as an example *Caprimulgus Europæus*.

Description: Male.—Plumage above and that of the throat ash-grey, thickly streaked and spotted with brown mostly of a yellowish tinge; head and neck with longitudinal blackish streaks; a white stripe beneath the base of the lower mandible extends along each side of the lower part of the head, and there is a central patch of white upon the throat; quills with the outer webs blotched with reddish-brown, and the three exterior feathers with a large white patch near the tips of the inner webs; tail irregularly marked and indistinctly barred with blackish-grey and yellowish-brown; the two external feathers on each side white at their termination. Plumage of the under parts yellowish-brown, with transverse blackish bars. Bill and irides dark brown; tarsi paler.

Female with the plumage of the male generally; but she wants the white spots on the quills and tail-feathers.

This is most probably the αἰγοθήλας (Ægothēlas, or Goat-sucker) of Aristotle and the Greeks, and the *Caprimulgus* of Pliny and the antient Italians. There is indeed, as we shall presently see, another European species, but it is very rare. The *Caprimulgus Europæus* is the *Calcabotto Piattaglione, Porta quaglie, Boccaccio*, and *Cova-terra* of the modern Italians; *Chotacabras* of the Spaniards; *Tette-chevre, Engoulevent ordinaire*, and *Crapaud volant* of the French; *Milchsauger, Geissmilcher, Nacht Rabe, Nacht Schwalbe*, and *Tag-Schläfer* of the Germans; *Natskraffa, Natskarra*, and *Quallknarren* of the 'Fauna Suecica;' *Nat-Ravn, Nat-Skade*, and *Aften-bakke* of Brunnich; *Muckenstecker* and *Nachtrabb* of Kramer; *Aderyn y droell, Rhodwr* of the antient British; and *Goat-sucker, Night-Jar, Jar-Owl, Churn-Owl, Fern-Owl, Dor-Hawk, Night-Hawk*, and *Wheel-Bird* of the modern British.



Caprimulgus Europæus.

The absurd story of the goat-sucking habits of this bird may be traced back as far as the time of Aristotle, and is probably of much older date. It has all the appearance of a deep-rooted popular prejudice, which was so extensively believed when that zoologist wrote, as to demand, in his opinion, insertion in his 'History of Animals.' In the ninth book of that history (c. xxx.), Aristotle says, 'The bird called *Ægothēlas* is a mountain-bird, a little larger than the blackbird (κοττύφου) and a little less than the cuckoo. It lays eggs to the number of two or three at most, and is of a slothful nature (βλακικός). Flying upon the goats, it sucks them (θηλάζει δὲ τὰς αἶγας προσπετόμενος), whence it has its name. They say that when it has sucked the teat it becomes dry, and that the goat becomes blind. It is not sharp-sighted by day: but it sees by night.' Ælian's version of the effect of the bird's sucking is confined to the part sucked. He says that the operation makes the teat dry or blind (τυφλὸν μαστόν), and so the flow of the milk is stopped. He speaks of the great audacity of the bird, observing that it is fearless of the vengeance of the goatherds (iii. 39). Ælian also refers to its goat-sucking propensity in c. 22 of book xvi. Pliny (*Nat. Hist.*, ix. 40) states that the '*Caprimulgi* are nocturnal thieves; for they cannot see by day (interdiu enim visu carent). They enter the folds (stabula), and fly to the udders of the goats in order to suck the milk, from which injury the udder dies away, and blindness falls upon the goats which have been so sucked.' Nor is the charge of goat-sucking the only false accusation made against the Night-Jar. White (*Selborne*) informs us that the country-people have a notion that the fern-owl, or churn-owl, or eve-jarr, which they also call a puckeridge, is very injurious to weanling calves, by inflicting, as it strikes at them, the fatal distemper known to cow-leeches by the name of puckeridge. 'Thus,' says White, 'does this harmless ill-fated bird fall under a double imputation, which it by no means deserves; in Italy, of sucking the teats of goats, whence it is called the *Caprimulgus*, and with us, of communicating a deadly disorder to the cattle. But the truth of the matter is, the malady is occasioned by the *œstrus bovis*, a dipterous insect, which lays its eggs along the chines of kine, where the maggots, when hatched, eat their way through the hide of the beast into the flesh, and grow to a very large size.' (White's *Selborne*.) Belon, in his folio edition (1555), gives no figure of this species, but appears to confound it with an Owl, '*L'Effraye* or *Fresaye*.' In the small 4to. 'Portraits d'Oyseaux,' &c. (1557), a figure is given at the end of the Owls, which, though bad, cannot be mistaken for anything but the *Goat-sucker*, with the titles of 'Αἰγοθήλας, *Strix Caprimulgus, Fur nocturnus, Effraye, Frezaye*,' with the following old quatrain:

> 'Le hideux cry de la Fresaye effraye
> Celuy qui l'oit; elle vole de nuict,
> Et à tetter les chevres prend deduict.
> T'esbahis-tu s'elle se nom Effraye?'

Food, Habits, Reproduction, &c.—The food of the European Goat-sucker consists chiefly of night-flying and evening-flying moths and beetles, *Phalænæ, Melolonthæ*, &c. In the stomach of one which Willughby opened were seeds as well as beetles. The Fern-chafer, *Melolontha solstitialis*, seems to be a favourite food, and hence the bird is frequently found in those neighbourhoods where fern abounds. It spends the summer in the temperate countries of Europe, but on the approach of winter retires to the south of the Mediterranean sea. Its arrival in these islands may be looked for from the middle of May to the end of that month, and its departure takes place towards the end of September or beginning of October. The earliest appearance of the bird in White's Calendar is dated on the 1st of May, and the latest on the 26th of that month. The last-named naturalist paid particular attention to the habits of this species. 'There is no bird, I believe,' writes that delightful observer, in a letter to Pennant, 'whose manners I have studied more than that of the *Caprimulgus* (the goat-sucker), as it is a wonderful and curious creature; but I have always found that though sometimes it may chatter as it flies, as I know it does, yet in general it utters its jarring note sitting on a bough; and I have for many an half-hour watched it as it sat with its under mandible quivering, and particularly this summer. It perches usually on a bare twig, with its head lower than its tail, in an attitude well expressed by your draughtsman in the folio *British Zoology*. This bird is most punctual in beginning its song exactly at the close of day; so exactly that I have known it strike up more than once or twice just at the report of the Portsmouth evening gun, which we can hear when the weather is still. It appears to me past all doubt that its notes are formed by organic impulse, by the powers of the parts of its windpipe, formed for sound, just as cats pur. You will credit me, I hope, when I assure you that, as my neighbours were assembled in an hermitage on the side of a steep hill, where we drink tea, one of these churn-owls came and settled on the cross of that little straw edifice and began to chatter, and continued his note for many minutes; and we were all struck with wonder to find that the organs of that little animal when put in motion gave a sensible vibration to the whole building! This bird also sometimes makes a small squeak, repeated four or five times; and I have observed that to happen when the cock has been pur-

suing the hen in a toying way through the boughs of a tree. Again—'On the twelfth of July I had a fair opportunity of contemplating the motions of the *Caprimulgus*, or Fern-owl, as it was playing round a large oak that swarmed with *scarabæi solstitiales*, or fern-chafers. The powers of its wing were wonderful, exceeding, if possible, the various evolutions and quick turns of the swallow genus. But the circumstance that pleased me most was, that I saw it distinctly, more than once, put out its short leg, while on the wing, and by a bend of the head deliver somewhat into its mouth. If it takes any part of its prey with its foot, as I have now great reason to suppose it does these chafers, I no longer wonder at the use of its middle toe, which is curiously furnished with a serrated claw.' Mr. Vigors (*loc. cit.*) remarks that the common Barn Owl (*Strix flammea*) possesses the same character of serrated *unguis:* and that some other species of the *Strigidæ* exhibit somewhat of the rudiments of it; thus establishing more closely the affinity of the *Owls* and the *Caprimulgi*. Mr. Vigors adds that his conjecture as to the use of the serrated claw—that is, its being devoted to the purposes of seizure—is considerably corroborated by the passage from White above quoted. At the same time he refers to Wilson, who in his account of the *Caprimulgus Carolinensis* (*Antrostomus Carolinensis* of Bonaparte) assigns a different use to this serrated claw. Of this species Wilson says, 'Reposing much during the heat of the day, they are much infested with vermin, particularly about the head, and are provided with a comb on the inner edge of the middle claw, with which they are often employed in ridding themselves of these pests, at least when in a state of captivity.' Upon this Mr. Vigors observes that such can be at best but an accidental use to which the serration can be applied. There are many other groups of birds, he adds, possessing the same character, to which the same application of it can never be assigned—for instance, the greater part of the genus *Pelecanus* of Linnæus. Many of these birds, whose feet, Mr. Vigors observes, are naturally ill adapted by their webbed structure for laying hold of any object, are yet found to incubate among trees, where the serrated claw may give them a further power of prehension; they are also, he remarks, asserted to seize their prey occasionally with the foot; in which acts the structure of the nail, as in the case cited by White respecting the *Caprimulgus*, may be peculiarly useful. 'The family of the *Ardeidæ* among the wading birds equally exhibit,' says Mr. Vigors, in conclusion, 'an analogous construction in the middle nail. Here again this character seems adapted to their mode of life in enabling them to hold their prey more firmly in those slimy and muddy situations where it might otherwise elude them; while, at the same time, it may assist their feet (which, like those of the *Pelecanidæ*, are naturally ill suited for grasping) in their hold among the trees, where, like some also of the latter family, they build their nests.' Mr. Dillon is of opinion that the chief use of the serrated claw is simply to comb out or dress the *vibrissæ* which surround the gape. Mr. Swainson opposes this view, observing that there is an American group of this family which have no bristles round the bill, and yet have the serrated claws; and another group in Australia which have bristles round the bill, and yet with the claw smooth and simple. He also observes that the Heron tribe have the gape smooth, but the claw serrated. Mr. Rennie remarks that the passage in Wilson 'appears to settle the question;' but he gives no satisfactory reason why.

The Goat-sucker is sometimes to be seen abroad in gloomy days; we have seen it on such days, and generally on the ground. On a tree it is observed to perch not across a branch, but on its longitudinal direction. These birds affect the neighbourhood of oaks, where in May they find the *Melolontha vulgaris*, and at Midsummer the *Melolontha solstitialis*. White graphically describes the evolutions of one round his 'great spreading oak,' where it was hawking after a brood of some particular *Phalæna* belonging to that tree. On this occasion he says it exhibited a command of wing superior to the swallow itself. The same author states that when a person approaches the haunts of this species in an evening they continue flying round the head of the obtruder; and by striking their wings together above their backs, in the manner that the pigeons called smiters are known to do, make a short snap; perhaps at that time, he adds, they are jealous of their young, and their noise and gestures are intended by way of menace. The eggs, two in number, oblong, white or dusky, and streaked somewhat like the plumage of the bird, are equal in size at each end, and are laid on the bare ground, generally among fern, heath, or long grass, sometimes in furze-brakes or woods, but always near the latter. Montagu describes the noise made by the male during incubation when perched, and with his head downwards, as not unlike that of a spinning-wheel, and notices its uttering a sharp squeak as it flies.

The other European species, *Caprimulgus ruficollis*, which is very rare, has been shot in the oak-woods some miles distant from Algeziras, and also in the valley of the Rio del Mel, near that city. The Spanish name for it is *Samala*. Mr. Gould has no doubt that its natural habitat is Northern Africa. The Prince of Musignano notes it as occurring in south-western Europe during the summer.

Mr. Gould has established a new genus for some of the American *Caprimulgi*, under the name of *Antrostomus*. [WHIP-POOR-WILL.]

Psalurus (Sw.). Gape strongly bristled. Tail excessively long, and very deeply forked.

Example, *Psalurus macropterus.*—A bright ruddy demi-collar ornaments the back part of the neck, and the two external tail-feathers in the male are much longer than the others. The tail of the female is much shorter.

Locality.—Paraguay and Brazil.



Psalurus macropterus (old male).

Chordeiles (Sw.). Gape perfectly smooth. Wings very long, equal to the tail, which is slightly forked.

Example, *Chordeiles Americanus*. Ground of plumage above, sides of the head and front of the neck, dark liver-

brown glossed with greenish. Head, neck, and upper rows of lesser wing-coverts spotted with yellowish brown; back, scapulars, and tertiaries mottled with brownish white, and a little wood brown, the pale colour forming speckled bars on the tail and its coverts; intermediate wing-coverts more thickly mottled with a purer white; greater coverts spotted with brown on the margin; band on middle of quills beginning on the inner web of the first and ending with the fifth, and a broad arrow-shaped mark on the throat pure white. A white dotted superciliary band reaches to the nape. Lateral tail-feathers banded with white. Plumage below and inner wing-coverts barred alternately with brownish-white and liver-brown. Bill blackish. Legs pale. Tail forked. Middle toe, which is longest, with a serrated claw.

This is the *Caprimulgus Americanus* of Wilson, and the *Caprimulgus Virginianus* of the Prince of Musignano, who notices the bird, in his *Geographical and Comparative List*, as *Chordeiles Virginianus* (Bonap.), and *Caprimulgus Popetue* (Vieill.). It is the *Peesquaw* of the Cree Indians.



Chordeiles Americanus.

Upper figure, Male. Lower figure, Female, with an egg.

Habits, Food, Reproduction, &c.—Dr. Richardson informs us that few birds are better known in the Fur Countries than this, which ranges in summer even to the most remote arctic islands. Captain (now Major) Sabine notices it, in the appendix to Captain (now Sir Edward) Parry's 'First Voyage,' as the *Musqueto Hawk*, and states that a female was found on Melville Island, lying dead on the ground about a quarter of a mile from the sea. He adds, that these birds are known to breed and inhabit as far north as Hudson's Bay; but as they live principally in woods, and feed on musquitoes and other winged insects, which are very rare in the North Georgian Islands, it is more than probable that the individual found dead was an accidental visitor, and had perished for want of food. It was extremely thin, but the plumage was in good preservation. Fabricius does not mention it; he observes in conclusion, as known in Greenland. Dr. Richardson states that its very peculiar noise is most frequently heard in the evening, and often seems to be made close to the listener, though the bird that produces it is so high in the air as to be nearly imperceptible. He describes this sound as resembling that produced by the vibration of a tense thick chord in a violent gust of wind, and says that the *Pisk* (the common name for the bird) considerably resembles some of the *Falconidæ* in its evolutions in the air. It often remains stationary, fluttering its wings rapidly, and then suddenly shoots off a long way, by a gliding motion: at that moment the loud vibratory noise is heard. 'It also traverses the air backwards and forwards, quartering the sky as regularly as the Hen Harrier surveys a piece of ground. The female deposits her eggs on the ground without making any nest, generally selecting the border of a cultivated field or an open glade in the forest, and, during incubation, sits so close, that she may be almost trodden down. When any person approaches her, the male sallies from the adjacent thicket and stoops at the intruder, passing within a foot or two of his head, then rising again and wheeling round to repeat the same manœuvre. In the meanwhile, his mate flutters from the nest along the ground as if disabled, and hides herself at a short distance among the grey grass, from which she can hardly be distinguished. The *Pisk* makes its first appearance at Great Bear Lake generally about the last day of May, and was observed hatching on the Saskatchewan on the 8th of June. Its eggs are narrower than those of *Caprimulgus vociferus*, but of the same colours, rather differently distributed; they measure nearly 14 lines in length.' (*Fauna Boreali-Americana.*)

Geographical Distribution.—See above. In Dr. Richardson's table, the extreme northern range of this bird is stated as 68° N. lat. (east of the Rocky Mountains, migratory), and he notices it as observed in the summer, when it is common, on the Saskatchewan, lat. 53° to 54° north, and from 600 to 1000 miles distant from the sea-coast; as very common in the vicinity of Philadelphia, lat. 40° N. (Bonaparte), but as not having its winter-quarters in the United States. It also appears in the doctor's list of species which summer or breed in the Fur Countries and in Pennsylvania, but winter farther to the southward. In the Prince's *Geographical and Comparative List*, the southern and central parts of North America are recorded as the localities of the species.

Scotornis* (Sw.).

General structure of *Caprimulgus*; but the outer toe is shorter than the inner.

Subgenera—*Scotornis.* Rictus strongly bristled. Tail lengthened, graduated, or rounded. (Sw.)

Example, *Scotornis climaturus*, *African Long-tailed Night-Jar.*

Description.—Size rather smaller than that of *Macrodipteryx*, although, from the development of its tail, it is much longer. The bristles considerably exceed the length of the bill; the third quill is longest; the first is rather shorter than the fourth, while the fifth is $\frac{4}{10}$ths of an inch shorter than the fourth. The tail is very long, measuring from the base 9 inches, of which 3¼ inches are occasioned by the two middle tail-feathers exceeding the others; the outer lateral toe is shorter than the inner. The ground colour of the plumage is light ferruginous brown varied with dark freckles. The chin and rictal stripe white; the lesser wing-coverts have at their tips a broad band of white, and the greater have a terminal spot of cream-colour, much smaller than the former. The ground colour of the five primary quills is entirely black, without any rufous, their tips only being freckled with grey; but they are crossed in the middle by a snowy-white broad band beginning in the inner web of the first and terminating on the outer web of the sixth quill: the remaining quills are varied with black and rufous and tipped with white. The tail is variegated in the usual manner, the middle pair of feathers having about 20 very slender transverse bars, but much

* In the *Classification of Birds*, Mr. Swainson prints *Scortornis*; but we apprehend *Scotornis* (Bird of Darkness) is meant; and so the word is printed in his *Birds of Western Africa.*

undulated, while the outer margin of the exterior feather, and the tips of that and of the next, are pure white. No grey in the plumage. Total length, including tail, 13 inches. (Sw.)

Locality.—Africa. Common in Senegal.



Scotornis climaturus. (Caprimulgus climaturus, Vieill.)

Macrodipteryx (Sw). Rictus strongly bristled. Wings long, equal to the tail, and with a lengthened reniform feather in each. Tail even.

Example, *Macrodipteryx Africanus, Pennant-winged Night-Jar*, or *Long-shafted Goat-sucker.*

Description.—Wings, for the small size of the bird, very long, rather exceeding, or at least equalling, the tip of the tail, which is quite even and consists of ten feathers. Of the three first quills, which are much the longest, the first is shorter than the third, which is slightly succeeded by the second. The long-shafted feathers are inserted immediately between the primary and secondary quills. The bristles of the mouth are strong and equal to the length of the bill, which is weak. The middle toe is lengthened, and the lateral toes are equal. Colour of the plumage mixed, as in others of the family. Upon each web of each of the primary quills is a row of nine rufous and nine black spots: the rufous bars become very small towards the tips, where the black predominates. The lesser quills are black, with four rufous bands, the tips black. The middle tail-feathers are grey, speckled with black points, and crossed by six black bars, all of which are irregular, excepting the last, which, as on all the other feathers, is regular, well defined, and placed just behind the tips; the outer web of the exterior feather is fulvous white, with about ten black spots, at equal distances from each other. Some of the scapulars have a broad cream-coloured stripe, which forms a connected series when the feathers lay over each other, but those which are conspicuous on the supposed female can scarcely be discerned in the male; this latter however has a few obscure white mottles on the chin, throat, and round the ears. Total length about 8 inches.

Mr. Swainson, from whose 'Birds of Western Africa' the above description is taken, observes that the female is entirely destitute of the long-shafted or supplementary feathers. 'Now this,' says Mr. Swainson, 'is a very important fact, for it goes far to prove that they are not essential to the economy of the species; for if otherwise, both sexes would possess them, unless it be contended, a supposition highly improbable, that the male feeds in one manner and the female in another. In the absence of all information upon this point, we are led to conclude that they are more ornamental than useful, given to the male sex as attractive decorations to the female, in a similar manner as the flowing feathers of the Paradise Bird are known to distinguish the male sex. Whether or no these ornamental plumes are lost after the season of incubation is a subject for future inquiry; but they are certainly of very unequal lengths in different individuals. We have seen them in one bird only seven inches long, while in that now before us they measure in extreme length seventeen inches; the webs occupy exactly six, while all the rest of the shaft is naked, the rudimentary hairs on each side merely indicating the position of the laminæ, had they been developed. We cannot subscribe to an opinion we have heard expressed, that these latter have been rubbed or worn off. Another specimen, which we suppose is the female, is perfect in all its plumage, but has no indication, as already observed, of these feathers. In their texture they are remarkably flexible, moving about with the least breath of wind. The inner web is so broad, that the laminæ in the middle measure 2¼ inches; the outer web, on the contrary, is very narrow, and the longest laminæ are hardly half an inch.'

This is the *Caprimulgus Macrodipterus* of Afzelius, and the *Caprimulgus longipennis* of Shaw.

Locality.—Africa, Sierra Leone.



Macrodipteryx Africanus. Male.

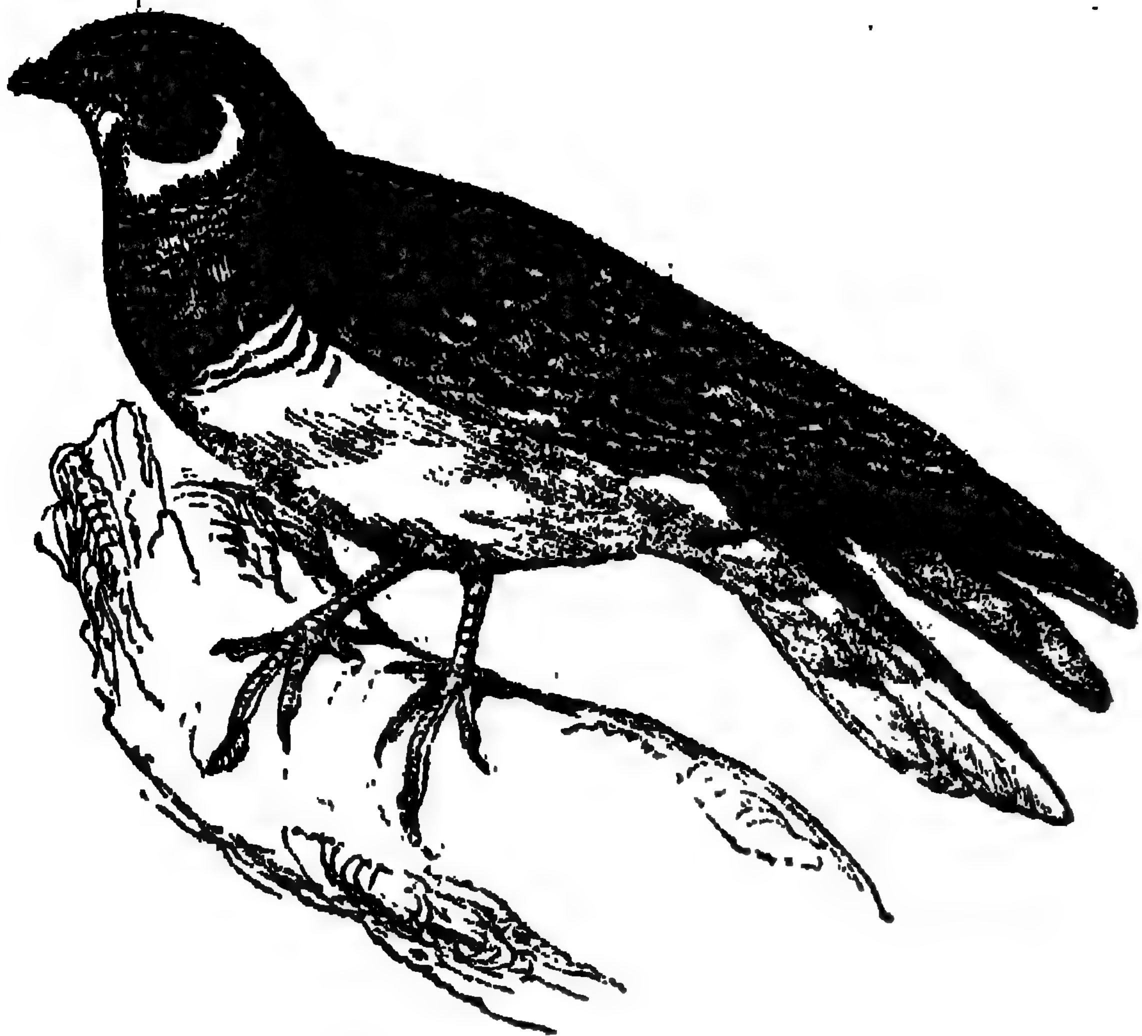
Proïthera (Sw.). Rictus almost smooth. Wings very long, equal to the tail, which is short and even. Tarsus very naked.

Example, *Proïthera diurna* (*Caprimulgus diurnus*, Wied., *Nacunda*, Temm.).

Description: Female.—Plumage above a mixture of grey-brown, yellowish-red, and brownish-black, marked with great spots of blackish-brown, with wide borders of yellowish-red; chin pale yellow, striped with grey-brown; tail marbled with brownish-black and bright yellow, with nine or ten transverse bands speckled with brownish-black. Plumage beneath white lineated with grey-brown; middle of the belly white, spotless. Length rather more than 10 inches.

Habits.—See ante, pp. 224, 225.

Locality.—Brazil and Paraguay.



Proithera diurna.

NIGHT HERON. [NYCTICORAX.]

NIGHTINGALE, the English name for the most celebrated of the song birds of the Old World. This well known species is the ἀηδών (Aëdon) of the antient Greeks; *Luscinia* of the antient Italians; *Rossignuolo, Rusignuolo,* and *Usignuolo* of the modern Italians; *Rossignol* of the French; *Ruiseñor* of the Spanish; *Nachtigall* of the Germans; *Nachtergahl* of the 'Fauna Suecica;' *Nattergale* of Brunnich; and *Eos* of the antient British.

It is the *Luscinia* of Gesner, Aldrovandus, Willughby, Ray, and Brehm; *Motacilla Luscinia* of Linnæus; *Sylvia Luscinia* of Latham and others; *Curruca Luscinia* of Fleming; and *Philomela Luscinia* of Selby, Gould, and Swainson.

'The Nightingale, or night singer, is a migratory bird visiting us early in the spring (about the middle of April), and leaving us about August or September. The male birds arrive first, and are instantly sought after by the bird-catchers, who generally make the most of the interval of ten days or a fortnight that elapses before the arrival of the females, well knowing that those males which are taken after they have paired seldom survive. The bird-fanciers have a notion that a Surrey Nightingale possesses the finest quality of tone. To dwell upon the richness and variety of its song, a subject which has employed the pens of poets of all ages, and of all countries where the bird is known, would be superfluous here; but there are points connected with the habits and geographical distribution of the bird which require notice.

M. Temminck states that the Nightingale haunts woods, thickets, and gardens; that it is common in nearly all the parts of Europe to Sweden inclusive; and that it migrates in winter into Egypt and Syria. Hasselquist saw it among the willows of Jordan and the olive-trees of Judea. Mr. Strickland saw it at Smyrna on the 5th of April. The Prince of Musignano notes it (*Specchio Comparativo*) as common in the neighbourhood of Rome, which it leaves in winter only. In his *Geographical and Comparative List,* the Prince records it as found in Europe generally.

Pennant (*Artic Zoology*) says that it visits the temperate parts of Russia, and even some parts of Siberia. The same author (*British Zoology*) remarks that the Nightingale is a species that does not spread itself over our island. 'It is not,' says Pennant, 'found in North Wales, or in any of the English counties north of it, except Yorkshire, where it is met with in great plenty about Doncaster. It has also been heard, but rarely, near Shrewsbury. It is also remarkable that this bird does not migrate so far west as Devonshire and Cornwall, counties where the seasons are so very mild, that myrtles flourish in the open air during the whole year; neither is it found in Ireland. Sibbald places Nightingales in his list of Scotch birds; but they certainly are unknown in that part of Great Britain, probably from the scarcity and the recent introduction of hedges there; yet they visit Sweden, a much more severe climate.' The editor of the last edition of the 'British Zoology' states that in 1808 a Nightingale was several times heard in the gardens of the earl of Lonsdale, in Fisher Street, Carlisle. M. Nilsson notes its arrival in Sweden by the 1st of May. Montagu informs us that it is said to be found only as far north as Yorkshire (his observations being confined to Britain), and certainly not farther west than the eastern borders of Devonshire; although they are plentiful both in Somersetshire and Dorsetshire. 'Why,' adds Montagu, 'they should not be found in all the wooded parts of Devonshire and Cornwall, which appear equally calculated for their residence, both from the mildness of the air and variety of ground, is beyond the naturalist's penetration. The bounds prescribed to all animals, and even plants, is a curious and important fact in the great works of nature. It has been observed, that the Nightingale may possibly not be found in any part but where cowslips grow plentifully; certainly with respect to Devonshire and Cornwall this coincidence is just.'

Mr. Blyth (*Analyst,* and *Note to an edition of* White's *Selborne*) enters fully into the inquiry as to the distribution of the Nightingale in Britain. Among other highly interesting observations, Mr. Blyth remarks that he thinks this bird appears to migrate almost due north and south, deviating but a very little indeed either to the right or left. He states that there are none in Brittany nor in the Channel Islands, Jersey, Guernsey, &c. Mr. Blyth is of opinion that the most westward of them probably cross the Channel at Cape La Hogue, arriving on the coast of Dorsetshire, and thence apparently proceeding northward rather than dispersing towards the west; so that they are only known as accidental stragglers beyond, at most, the third degree of west longitude—a line which cuts off the counties of Devonshire and Cornwall, together with Wales and Ireland. Mr. Gould (*Birds of Europe*), after referring to Mr. Blyth's papers in the 'Analyst,' states that the Nightingale appears to be confined to particular districts: it is, he remarks, plentiful in the southern and eastern counties, while Devonshire appears to be its limit westward, and Doncaster in Yorkshire in a northern direction, few if any authenticated instances being on record of its occurrence beyond that town, which is the more singular, as Nightingales are common in Sweden and other countries situated farther north than England. 'Our own observation,' continues Mr. Gould, 'respecting the migrations of the Nightingale is, that after leaving our island it proceeds to the opposite shores of the Continent, and gradually makes its way southwards, until it arrives in Africa, which is its ultimate resting-place during our winter months. We have ourselves received specimens killed in the northern districts of Africa, but have never obtained any from the central or southern parts of that portion of the globe; it would appear therefore that its distribution over that vast continent is comparatively limited. In no part of Europe is it more abundant than in Spain and Italy; from whence, however, equally as from our own, it regularly migrates on the approach of winter.' The islands of the Greek Archipelago are among the favoured localities visited by this delightful bird. Mr. Yarrell (*History of British Birds,* now in the course of publication) says, 'When we consider that this bird extends its visits during the summer as far north as Russia and Sweden, its very limited range in this country is unaccountable. It is found in Sussex, Hampshire, Dorsetshire, and the eastern part only of Devonshire, along the line of our south coast. It has been heard about Teignmouth and Exmouth, but no farther west in that direction. In North Devon it has been heard near Barnstaple, but not in Cornwall or Wales. A gentleman of Gower, which is the peninsula beyond Swansea, procured from Norfolk and Surrey, some few years back, some scores of young Nightingales, hoping that an acquaintance with his beautiful woods and their mild climate would induce a second visit; but the law of nature was too strong for him, and not a single bird returned. Dyer, in his "Grongar Hill," makes the Nightingale a companion of his Muse in the vale of Towey or Caermarthen; but this is a poetical licence, as the bird is not heard there.'

It is singular, that concurring, as all the more modern authors do, that the Nightingale is not now to be found in Wales, a Welsh name for the bird should exist; yet Pennant gives this name in his list, and it will be found at the head of this article. Pennant, be it remembered, only excludes it from North Wales.

In Ireland the Nightingale seems never to have been heard.

Mr Yarrell, who remarks that it is not included by Mr. Rylands in his 'Catalogue of the Birds of Lancashire,' though it has been heard as high up as Carlisle, but no farther, goes on to state, that on the eastern side of our island the bird frequents Essex, Suffolk, Norfolk, some of the more wooded parts of Lincolnshire, and several parts of Yorkshire; but not higher than five miles north of the city of York, as he learned from his friend and correspondent Mr. Thomas Allis. Mr. Yarrell states his belief that it has not been heard in Scotland or in the Scottish islands, which, he adds, considering that it visits Denmark, is extraordinary. He then quotes from a note to an edition of White's 'Selborne,' published in Edinburgh, the following record of an attempt to establish the Nightingale in Scotland:—'It has been generally believed that the migratory songsters, both old and young, return to their native haunts in the breeding season. . . . Impressed with this belief, Sir John Sinclair, Bart., long known for his patriotism, commissioned the late Mr. Dickson, of Covent Garden, to purchase for him as many Nightingales' eggs as he could procure at a shilling each. This was accordingly done, the eggs carefully packed in wool, and transmitted to Sir John by the mail. Sir John employed several men to find and take care of the nests of several Robins, in places where the eggs might be deposited and hatched in security. The Robins' eggs were removed, and replaced by those of the Nightingale, which were all sat upon, hatched in due time, and the young brought up by the foster parents. The songsters flew when fully fledged, and were observed for some time afterwards near the places where they were incubated. In September, the usual migratory period, they disappeared, and never returned to the place of their birth.'

Description.—Rich brown above; rump and tail with a reddish tinge; throat and middle part of belly dirty or greyish white: lateral parts of the neck, breast, and flanks grey; bill and legs light brown. Sexes alike.

Habits: Food; Reproduction.—The Nightingale shuns observation, abiding in the thickest coverts, and in these the nest is sometimes placed on a low fork, but generally on the ground. Withered leaves, particularly those of the oak, very loosely conjoined with dried bents and rushes, and lined internally with fine root-fibres, form the structure. The eggs, of an olive-brown, are four or five in number. After the young are hatched, generally in June, the melodious song of the male ceases, and is succeeded by a low croak, varied occasionally with a snapping noise; the first is considered to be meant for a warning, and the last as a defiance. The food consists of insects, such as flies and spiders, moths and earwigs. Green caterpillars were the food brought by the parent birds to the nest of young Nightingales taken by Colonel Montagu. It is not improbable that the bird's choice of localities is in some measure determined by the absence or presence of some favourite insect food.



Luscinia Philomela (Bonaparte). The Nightingale.

There is another European Nightingale (*The Thrush Nightingale. Philomela Turdoides* of Blyth, *Luscinia major* of Brisson, *Sylvia Philomela* of Bechstein), inhabiting central Europe. The song of this species is loud, but far inferior to that of the true Nightingale. It is said to be common in Egypt.

Mr. Swainson makes the *Philomelinæ* the second subfamily of his *Sylviadæ*. [SYLVIADÆ.]

NIGRIN, oxide of titanium, containing about fourteen per cent. of iron. It resembles menaccanite in colour, lustre, and appearance of the fractured surfaces. It occurs in Ceylon and in Transylvania.

NIKA, a name given by M. Risso to a genus of *Macrurous Crustaceans*, placed by M. Milne Edwards between the genera *Caridina* and *Athanas* in the tribe of *Alpheans*, to which the latter zoologist also refers the genus *Autonomea*. [SALICOQUES.]

NIKON, a celebrated personage in the annals of Russia, and the sixth patriarch in the Russian church, was born in May, 1605, in a village near Nischnei-Novgorod, where his father was a husbandman. A natural inclination for study led him to become the pupil of a monk in the convent of St. Makarius. The taste which he there acquired for monastic life and discipline was so strong, that although he married, in compliance with the pressing instances of his family, he separated from his wife after ten years' union, and prevailed upon her to enter the convent of St. Alexis at Moscow, while he himself retired to a small island in the White Sea, not far from Solowetz, where there was a brotherhood of hermits living in detached cells. The desolation of the place and the severity of the discipline served rather to increase than to abate the ardour of the new recluse; but the zeal of the brethren led to dissensions that terminated in his expulsion, or at least his flight. Being desirous of replacing their wooden church by a stone edifice, Nikon, and Elizar, the founder and head of the community, proceeded to Moscow, where they collected contributions for the purpose; but on their return, Elizar took the money into his own keeping, and manifested no intention of applying it to the intended purpose. This led to remonstrances and altercations; and to such persecution on the part of Elizar, that Nikon pushed off from the island in a small boat; and after incurring great danger, was driven to the island Kj, at the mouth of the Onega, where he set up a wooden cross. At the same time he made a vow to erect a monastery on that spot, in fulfilment of which may now be seen the magnificent cloister of the Holy Cross. Associating himself with a community called the Koscheoser hermits, he so distinguished himself by his superior sanctity and severity of life, that on the death of their abbot, or principal, he was elected in his place, in 1645. Being compelled three years afterwards to take a journey to Moscow, to arrange some affairs of their community, he there became known to the Czar Alexis Mikailovitch, who was so struck with his eloquence and understanding, that he caused him to be appointed archimandrit of the Novospasky Convent. A new career was thus suddenly opened to him: his influence with the sovereign increased daily, and he employed it in behalf of the distressed. On being appointed metropolitan of Novgorod, in 1648, he attached the people of that city to him no less strongly: his eloquence drew crowds to hear his discourses in the cathedral, and his bounty maintained numbers during a severe famine. Besides this he appeased a violent popular insurrection at Novgorod in 1650, at very imminent peril to his own person. In the mean while he continued in high favour with the Czar, who frequently corresponded with him, and who, on the death of the patriarch Joseph, in 1652, appointed him his successor. It was about this time that he commenced his reforms in the books, as he had previously done in the liturgy, of the church; and held several councils relative to the translations of the Scriptures. But herein his zeal led to his disgrace: his reforms were regarded as dangerous innovations; and notwithstanding the Czar had shown such friendly confidence in him as to place his own family under his care during the pestilence at Moscow in 1653-4, and had attended at the consecration of the Voskresensky monastery (erected by Nikon) in 1657, the patriarch's enemies contrived to prejudice him in the good opinion of his sovereign, and in 1658 he retired to the monastery just mentioned, situated about forty versts from the capital, whence he refused to return. How this unfortunate quarrel and misunderstanding originated is not precisely known; and it will be sufficient here to remark that it increased, till at length, in 1667, a

council was held at Moscow, at which the Czar himself presided, and which was attended by the patriarchs of Alexandria and Antioch, those of Constantinople and Jerusalem having excused themselves. The result was that Nikon was deposed from his dignity, and was banished to the Bieloozersky monastery, with the rank of a simple monk. There he remained until after the death of Alexis, whose successor, Pheodor Alexievitch, granted him permission to return to the Voskresensky monastery; but he died on his journey thither, at Yaroslav, August 17th, 1681, at the age of seventy-five.

Nikon compiled a collection of ancient Russian chronicles to the year 1630, which were printed by the Academy of Sciences of St. Petersburg, in eight volumes, quarto, 1767-1792. He also wrote several dogmatical and theological pieces, which were printed in his lifetime.

NILE (*Nilus*, in Latin), the name of the great river of Eastern Africa, the various branches of which have their rise in the high lands north of the equator, and, flowing through Abyssinia and other regions to the westward of it, meet in the country of Sennaar. The united stream flows northwards through Nubia and Egypt, and after a course of more than eighteen hundred miles from the farthest explored point of its principal branch, enters the Mediterranean by several mouths, which form the delta of Egypt. The word Nil seems to be an old indigenous appellation, meaning river, like that of Gir in Soudan and other countries south of the Atlas. The modern Egyptians call the river Bahr-Nil, or simply Bahr; in Nubia it is called by various names; in Sennaar the central branch, or Blue River, is called Adit; and in Abyssinia, Abawi. The three principal branches of the Nile are—1, the Bahr el Abiad, or White River, to the west, which is now ascertained to be the largest and longest; 2, the Bahr el Azrek, or Blue River, in the centre; 3, the Tacazze, or Atbara, which is the eastern branch. These three branches were known to Ptolemy, who seems to have considered the western as the true Nile, and to have called the others respectively Astapus and Astaboras. He fixed the sources of the western river in numerous lakes at the foot of the Mountains of the Moon, which he placed in 10° S. lat. Strabo (p. 821) speaks of the island of Meroe as bounded on the south by the confluence of the Astaboras, Astapus, and Astasobas. In another place (p. 786) he says that the Nile receives the Astaboras and the Astapus; which latter 'some call the Astasobas, and say that the Astapus is another river which flows from some lakes in the south, and makes pretty nearly the direct course of the Nile, and is swollen by the summer rains.' While these passages certainly prove that the antient geographers knew that there were three main streams, they also prove that their notions about them were confused. The numerous reports of the natives, who call this ridge or group of Mountains by the Arabic version of the same name, Jibalu 'l Kamari, though generally pronounced Jibali 'l Kumri, which would mean 'blue mountains,' seem to agree in placing the sources of the Abiad several degrees north of the equator, at nearly an equal distance between the eastern and western coasts of Africa. But we have no positive information either as to the true position of the sources or of the mountains. According to the report of Antonio Fernandez given by Tellez, the high land of Abyssinia extends to the south into the kingdom of Narea, the northern part of which is about 8° N. lat., and it probably extends thence to the westward through central Africa. The Bahr el Abiad was traced upwards by Linant, in 1827, as far as Aleis, a direct distance of 132 geographical miles south of Khartum, which is in 15° 34′ N. lat. and about 32° 30′ E. long., and at the confluence of the Blue and White Rivers. Since that time a party of Turco-Egyptians, headed by Ibrahim Kashef, an officer of the viceroy of Egypt, marched upwards from Khartum for thirty-five days along the banks of the river. On the twelfth day they reached the first island of the Shilluks, and after traversing the territory of that people they entered on the twenty-ninth the country of the Denka, probably the Donga of Browne, through which they continued to ascend along the banks for six days more, when they began to retrace their steps. At this point the river was shallow, full of islands, and six hours in breadth; and there were no mountains in sight. The latter part of the march appears from the description of Ibrahim to have been in a direction nearly west, and as the first island of the Shilluks, which they reached on the twelfth day, is not far from Aleis, according to Linant's statement, the extreme point attained by Ibrahim was probably about 10° N. lat. and 29° E. long. The result of this expedition agrees with Browne's report from hearsay, in giving an easterly course to that part of the river which is south of Dar-Fur, and placing its sources full to the south-westward of that kingdom. (Col. Leake's paper 'On the Quorra,' in the 2nd vol. of the *Journal of the Royal Geographical Society of London*, and Linant's *Journal of a Voyage up the Bahr el Abiad*, with some general notes on that river and illustrative maps, in the same volume.) The enormous breadth attributed to the Abiad by the Turkish party, although it may be exaggerated, leaves little doubt that the river at the extreme point of their journey was much broader than at its junction with the Blue River, and indicates that it has a peculiar character, its origin being perhaps in a lake or lakes which may be supplied by streams flowing from a distant range of mountains. The existence of lakes which have communication with the river only in time of high water is rendered highly probable by a passage in Linant's 'Journal,' which states that at the time of the inundation of the White River a prodigious quantity of fish is brought down towards Khartum by the current.

Mr. Holroyd, in his 'Notes on a Journey to Kordofan in 1836-7,' in the ninth volume of the 'Journal of the London Geographical Society,' states that Khurshid Pasha told him that he had been twenty-one days above Aleis, on the Bahr Abiad, in the boats of the country with soldiers, and had reached Denka. He mentioned that the river divided a considerable distance above Khartum, but was not prepared to say which was the direction of the White Nile properly so called. In the country of the Shilluks it seems that several rivers join the Bahr Abiad from the west, the names of which are mentioned by Linant in his Notes. One of these may be the Bahr el Adda mentioned by Browne as the last western tributary of the Bahr Abiad.

The Bahr Abiad, which at its confluence with the Blue River is only about 1800 feet wide, is described by Linant as being, just above it, in many places a mile and a half wide in the month of April, and even then far within its regular banks, which sometimes appeared four miles distant from one another, and were distinctly marked beyond these limits by a wide sandy beach without any appearance of verdure. But even this is not the full width at the greatest height, as the river then overflows the adjoining country, and the waters extend in some places above twenty miles from side to side. The shores of the river are very flat, especially on the western side, and the water is deep only towards the middle of the stream, where Linant found it to be from three to four fathoms. The rise of the Bahr Abiad is not perceptible till some time after that of the Bahr Azrek, according to Linant; but an American who accompanied Ismael Pasha to Sennaar in 1821 says that 'the Abiad commenced its rise this year about twenty days sooner than the Adit (the name of the Blue River in Sennaar), and that the difference of colour of their waters proves that they flow through very different soils. The white colour of the Abiad is occasioned by a very fine white clay with which its waters are impregnated, whilst the Adit is almost black during the season of its increase.'

At the confluence the contrast between the two streams, says Linant, is very great, the waters of the Abiad being always white, and as it were soapy, even in the dry season, when the Azrek is of a greenish hue. The Abiad remains of the same colour during the inundations, when the Bahr Azrek becomes reddish owing to the alluvium brought down by its affluent the Bahr Toumet, which comes from the highlands of Narea and falls into the Azrek in the province of Fazuolo, above Sennaar.

The Bahr el Azrek, or Blue River, which was long supposed to be the main branch of the Nile, has three sources in the high land of Gojam, near the village of Geesh, south-west of lake Dembea, in 10° 59′ 25″ N. lat. and 36° 55′ 30″ E. long., according to Bruce's observations. The Agows, who inhabit that district, worship the river. [ABYSSINIA; BRUCE.] The sources of the Azrek appear to have been visited by Father Paez, and perhaps by other missionaries, long before Bruce. The vast importance attached to that discovery has become much diminished since the information which we have acquired of the Abiad, whose sources are still unexplored, and still involved in that mystery which the antients represent as hovering about the fountains of the Nile. After a north and north-west course of about seventy miles, the Azrek, or Abawi, as the Abys-

synians call it, enters the lake Dembea or Tzana on its south-western side. This fine lake is sixty-five miles in length from south-east to north-west, according to Bruce's map, and above thirty in its greatest breadth; its surface is more than twice that of the lake of Geneva. It occupies the centre of an elevated table-land, surrounded by hills and mountain ranges, from which numerous streams fall into the lake. The Blue River, issuing from the lake at its south-east extremity, runs first to the south-east, forming a large cascade at Alata; after which it flows nearly due south, and then turns to the south-west, encompassing the provinces of Gojam and Damot, and leaving Amhara Proper on its right or eastern bank. After receiving several affluents from the high lands of Shoa and Efat, it turns to the north-west, forming a curve which twice intersects the tenth degree of north latitude, being nearly the same parallel as that of the farthest explored point of the Abiad, which is six degrees of longitude farther west. The vast tract between the two rivers is yet unexplored; it is nominally dependant on Sennaar, and is inhabited by the Denka, the Shilluks, the Bokki, and other Negro tribes, who are pagans.

On the 1st of January, 1822, Ismael Pasha, son of the viceroy of Egypt, with 1500 men, started from Fazoclo, which is about 11° 20′ N. lat., on the left bank of the Blue River, and marched southwards into the interior in search of the gold-mines of Quâmâmyl. After crossing the Bahr Toumet, an affluent of the Azrek, in about 10° 50′ N. lat., they discovered on the 18th the first appearance of gold mixed with the sand in the beds or borders of rivulets. Cailliaud, who accompanied the expedition, found that the washing of the sands produced very little, only four grains of gold in a hundred weight of sand. A negro chief told Ismael that after the rainy season there were sometimes found bits of gold of the size of beans. After seventeen days passed among golden sands, Ismael became convinced of their barrenness; and on the 5th of February gave orders to proceed farther south, and in two days arrived at Singue, south-west of Quâmâmyl, and in about 10° 30′ N. lat. and 34° 30′ E. long. But the negro inhabitants of the neighbouring mountains became so troublesome and daring, that Ismael was obliged on the 11th of February to order a retreat towards Fazoclo. (Cailliaud, *Voyage à Meroé, au delà du Fazogl, &c.*, 1826-7.)

Continuing its course in a north-north-west direction, towards the low country of Sennaar, the Azrek, or Adit, as it is here called, after crossing the province of Fazoclo, a dependency of Sennaar, passes by the town of Sennaar, which is on its left bank, in about 13° 30′ N. lat. and 33° 45′ E. long. Continuing to flow nearly in the same direction, it receives on its right bank the Dandur, Rahat, and other streams which flow from the outer or western side of the highlands which enclose the basin of lake Dembea. The country on its left bank, and between it and the Abiad, constitutes the kingdom of Sennaar proper, which is also called Al Jezira, or the island [SENNAAR], and is divided by the Azrek from Halfay, a Nubian province, forming part of the country of Atbara, or island of Meroe. [NUBIA.] At Khartûm the White and Blue rivers unite, the former being the wider; and the two streams flow for several miles in a common bed without mixing their waters, like the Rhône and the Arve below their junction near Geneva. After passing Halfay the united stream of the Nile bends towards the north-east, passes by Shendy and the ruins of Meroe, and on entering the country of Berber it receives on its eastern bank the Tacazze or Atbara, the third great confluent of the Nile.

The following is a description of the appearance of the Nile in its course through Upper Nubia. 'The Nile below the point of junction of the Abiad and Azrek presents a truly magnificent spectacle. Between Halfay and Shendy the river is straightened, and traverses a deep and gloomy defile formed by high rocky hills, between which the Nile runs dark, deep, and rapidly for about twelve or fifteen miles. On emerging from this defile the river again spreads itself majestically and flows between immense plains of herbage bounded only by the horizon. About thirty miles above Noureddin, the head village of Berber, we passed the mouth of the Bahr el Iswood (the Tacazze) on the eastern shore; it is the last river that empties itself into the Nile. I estimated it at about two-thirds of a mile at its embouchure. The Nile below the point of junction of this river is more than two miles broad from bank to bank.' (*Narrative of an Expedition to Dongola and Sennaar under Ismayl Pacha*, by an American, London, 1822.)

The Tacazze, perhaps the Astaboras of the antients, rises in the high mountains of Lasta, in about 11° 40′ N. lat. and 39° 40′ E. long. Its sources were known to the Jesuit missionaries in Abyssinia, and have been visited of late years by Pearce. It flows for a considerable distance in a northern direction between the range of the Samen mountains on the west, and those of Lasta, Salowa, and Bora on the east. It receives on its right bank the Arequa from Antalo. On arriving at 13° 15′ N. lat. the Tacazze turns to the north-west, forming the boundary between the kingdom of Amhara, on its left, and Tigre on its right bank. The river has numerous rapids, which render it fordable at most seasons of the year. Salt saw in it enormous crocodiles of a greenish colour and large hippopotami. Proceeding north-west the Tacazze flows through the lowlands of Waldhuba and Walkayt, which are dependencies of Tigre; and about 14° 50′ N. lat. and 36° 40′ E. long. it receives on its left bank the Angrab, which rises on the north slope of the high land of Dembea. It afterwards receives several other streams which come from the same direction and pass through the country of Ras el Feel, which was visited by Poncet and Bruce. It then inclines more to the north; and between the parallels of 16° and 17° N. lat., in the country of the Taka, it is supposed to receive on its eastern bank the Mareb, a considerable stream which comes from Tigre, and the course of which has been traced north-west to within a short distance from the Tacazze. [BEJA, or BOJA.] The Tacazze then passes Gous Radjib, visited by Burkhardt on his journey to Suakim in 1814, and inclines again to the north-west, forming the boundary of the so-called island of Meroe and the Berber country [BARABRA]; and at last enters the Nile at 17° 45′ N. lat. and about 34° 5′ E. long. A short distance before its confluence the Tacazze receives on its right bank the Mogren from the north-east, which rises in the Langay ridge near the Red Sea, in the country of the Bishareens. At the season of the inundation the Bahr Mogren brings down from the interior a quantity of black earth, which is said to affect the colour of the Nile. (Linant's *Notes on the Bahr el Abiad.*)

The Nile, from the confluence of the Tacazze down to its entrance into the Mediterranean, a distance of 1200 geographical miles measured along the course of the river, receives no permanent streams; but in the season of rains it receives wadys, or torrents, from the mountains which lie between it and the Red Sea. After flowing through Berber in a north-north-western direction, a populous and fertile district, and full of villages, the Nile enters a barren and dreary country, where the desert sands come close to the river's edge. The rocks and stones of the desert are generally of black granite. No verdure is to be seen, except on the margin of the river. On arriving at about 19° N. lat. the Nile turns nearly direct west, and forms the large island of Mograt. This district is called El Raba Tab; and its malek, or chieftain, is said to rule over eighty-five large and fertile islands formed by the Nile, besides the adjacent banks. The Nile below Mograt turns abruptly to the south-west. This is known as the great bend of the Nile. Continuing in the same direction, it passes through the country of the Sheygia Arabs. [BARKAL.] Arriving at the village of Korti, 18° N. lat. and 31° 50′ E. long., the river turns to the west; and after a course of about thirty miles in that direction, it resumes a northern course, flowing through the province of Dongola. The breadth of the cultivable land on each bank through the Dongola country, which is above 100 miles in length, varies from one to three miles, beyond which is the desert. The left or western bank is the more fertile, the eastern bank being in many places sandy and barren. Some of the islands, such as that of Argo, are very fertile. (Waddington and Hanbury's *Travels*; Rüppel's *Travels in Nubia and Kordofan.*) North of Argo, in 19° 40′ N. lat., the Nile enters the province of Dar Mahass, in Lower Nubia, where it forms a cataract, or rapid, commonly called the third cataract by those who ascend the river. After several windings the river inclines to the north-east; and near 22° N. lat. forms the second cataract, called Wady Halfa, after which it passes the splendid temple of Ipsambul. [ABUSAMBOUL.] Continuing its north-east course, the Nile passes by Derr, Dandour, and Kalabsheh; and at about 24° N. lat. forms the last cataract between granite rocks which cross the river near Essouan, or Assouan. Along this tract of Lower Nubia the valley of

the Nile is very narrow, 'the rocks of the eastern and western mountains often coming close to the river, and leaving little space for the deposit of alluvium: in other places, on the Libyan side, the sand covers the whole level space between the hills and the bank; and the character of the country between Wady Halfa and Assouan is totally different from that of Egypt. The river about Kalabsheh rises between 30 and 40 feet perpendicularly during the inundation; and after it has subsided, in February, the stream runs at a rate of two or three nautical miles an hour.' (Sir J. Gardner Wilkinson, *On the Nile and Former Levels of Egypt*, in *London Geog. Journal*, vol. 9.)

After entering the boundaries of Egypt the Nile flows through the whole length of that country, which it waters and fertilises. Egypt owes to the Nile its very existence as a productive and habitable region, and accordingly, in olden times, the people worshiped the beneficent river as their tutelary god. A full account of the Nile in its progress through Egypt, of its periodical rise, and its delta and various mouths, is given under EGYPT.

The rich alluvial deposit which the Nile spreads over the lands of Nubia and Egypt is mainly derived through the Blue River and its affluents the Toumet, Tacazze, Mareb, &c., from the high lands of Abyssinia: the White River brings no such alluvial deposit; but its stream, rising about the same time as the Blue River, assists in raising their combined waters over the lands, which they fertilise in their northward course. Owing to the yearly deposit of alluvial matter, both the bed of the Nile and the land of Egypt are gradually raised, the elevation varying in different places, and always lessening in proportion as the river approaches the sea. According to an approximate calculation, the land about the first or lowest cataract has been raised nine feet in 1700 years, at Thebes about seven feet, and at Cairo about five feet ten inches; whilst at Rosetta and the mouths of the Nile, where the perpendicular thickness of the deposit is much less than in the valley of Central and Upper Egypt, owing to the great extent east and west over which the inundation spreads, the rise of the soil has been comparatively imperceptible. (Wilkinson.) As the bed of the Nile always keeps pace with the elevation of the soil, and the proportion of water brought down by the river continues to be the same, it follows that the Nile now overflows a greater extent of land, both east and west, than in former times; and that the superficies of cultivable land in the plains of Thebes and of Central Egypt continues to increase. All fears therefore about the stoppage of the overflowing of the Nile are unfounded. In the valley of the Nile the banks are much more elevated than the land at a distance from the river, and they are seldom quite covered with water, even during the highest floods. The difference between the height of the banks and the land near the edge of the desert is often as much as 12 and 15 feet. The dykes which form a communication between the villages during the inundation commence on a level with the banks of the river, and as they extend into the interior rise to so great a height above the fields as to leave room for the construction of arches for the passage of the water. This appearance of an elevated strip of land along the banks of a river, sloping towards the interior, is common to other river valleys which are subject to periodical inundations.

NILEUS, a surgeon of the Alexandrian school, celebrated for the invention of a machine called the 'plinthium,' which was employed with success in reducing luxations of the femur. (Cels., *De Med.*, lib. viii., cap. 20; Oribas., *De Machinam*, cap. 8, p. 617.) Some of his medicines are quoted by Galen, Aëtius, Celsus, Paulus Ægineta, Cælius Aurelianus, and Oribasius. The exact time when he lived is not known; but as he is mentioned by Celsus, we may perhaps safely place him a little before the beginning of the Christian æra.

NILGHERRY MOUNTAINS. [HINDUSTAN, vol. xii., p. 207.]

NÎMES or NISMES, a town in the south of France, capital of the department of Gard, in 43° 50′ N. lat. and 4° 23′ E. long.; 358 miles from Paris in a direct line south by east, 450 miles by the road through Auxerre, Lyon, Vienne, Valence, and Pont St. Esprit, or 417 miles by the road through Nevers, Moulins, Clermont, and Mende.

Nîmes, antiently Nemausus (Νέμαυσος), is a town of great antiquity. Strabo (p. 186. Casaub.) notices it as the capital of the Celtic nation, the Volcæ Arecomici, or Aricomisci (Οὐωλκαι Αρικομισκοί), and states that though inferior to Narbonne in the number of strangers and others resorting to it for the purposes of trade, it was superior in the number of citizens; the town exercised authority over twenty-four populous villages, and enjoyed the 'Jus Latii,' by virtue of which those elected to the ædileship or quæstorship in Nemausus acquired the rights of Roman citizens. Nemausus was situated on the high road from Italy into Spain, which, though in excellent condition in summer, was in spring and winter impeded by mud or by floods caused by the mountain torrents. It was fortified with walls and gates by the emperor Augustus, about fourteen years before the Christian æra. In the downfal of the Roman empire Nîmes suffered much. It fell into the hands of the Visigoths, and was comprehended in the kingdom established by them in the south-west of France and in Spain; it was besieged by Wamba, king of the Visigoths (about A.D. 673), against whom it had rebelled, and was subsequently taken by the Saracens, from whom it was wrested by Charles Martel, at whose hands the town suffered much. In the tenth century it became the capital of an hereditary viscounty, and after some changes was united to the crown of France, in the reign of St. Louis, A.D. 1258. In the religious wars of the sixteenth century it was one of the strongholds of the Calvinists: it submitted to Louis XIII., who dismantled the fortifications. In the earlier periods of the French revolution (A.D. 1791) and on the second restoration of the Bourbons (A.D. 1815) it was the scene of serious intestine troubles, political or religious.

Of all the towns in France, Nîmes preserves the most striking memorials of its antient grandeur. It has been styled 'a second Rome.' The antient building known as La Maison Carrée (the square house), is not square, as its name would imply, but a parallelogram. It is surrounded by thirty fluted Corinthian columns, so arranged as to present eleven on each side, six in the front, and as many at the back: the columns at the angles being in this computation counted twice. The columns on the back-front and eight of those on each side are half encased in the wall of the building which fills up the intermediate spaces; the remaining three columns on each side and those of the front belong to the portico, which is of considerable depth in proportion to its width, and is open on three sides. The pillars are nearly 30 feet in height, and nearly 3 feet in diameter; but M. Millin, from whom we borrow these dimensions (*Voyage dans les Dép. du Midi de la France*), does not say whether the first of them includes the base and capital, or is that of the shaft alone. The intercolumnar spaces are less than two diameters in breadth. The total length of the building is given by M. Millin at 72 French (or 77 English) feet, including, we presume, the depth of the portico; the breadth is 36 French (or 38½ English) feet: our authorities do not state whether these are exterior or interior measurements; they are probably exterior. The cornice and frieze run all round the building, and, as well as the capitals of the columns, are regarded as models of architectural beauty: indeed the building is so enriched as to require a large and accurate drawing to do it justice. The very corona is fretted. The only entrance to the building is by a door in the front under the portico; and there were originally no windows; it is conjectured that light was obtained by openings in the roof. The Maison Carrée, like most of the temples of antiquity, was enclosed. The recent excavations, made about three years ago, render it probable that another similar building faced the temple, at some little distance from it. Séguier, a French antiquary, conjectured that it was dedicated to Caius Cæsar and Lucius Cæsar, the grandchildren of Augustus; but it has recently been shown by M. Auguste Pelet to have been erected to M. Aurelius and L. Verus. Probably there were two temples within the same enclosure, one dedicated to Aurelius, the other to Verus. In the middle ages it served as a town-hall, was afterwards part of the offices of a private house, and in the time of Louis XIV. the canons of St. Austin fitted it up as a church. When visited by M. Millin, in the reign of Napoleon, it was defiled by filth and exposed to the mischievous pranks of children. The Maison Carrée is now used as a museum for objects of antiquity. The State House at Richmond, in Virginia, which stands on a commanding elevation, is a copy of the Maison Carrée. The plan and drawings were sent to Virginia by Mr. Jefferson, when he was minister of the United States at Paris.

The amphitheatre, which is near La Maison Carrée, is in

better preservation than the Coliseum at Rome, and of greater extent than the amphitheatre of Verona. It is a perfect oval. The greater diameter, including the thickness of the wall, is estimated at 405 French, or 434 English feet; the smaller diameter, 317 French, or 340 English feet. The exterior wall, which is nearly perfect, consists of a ground story and an upper story, each pierced with sixty arches, and is surmounted by an attic. Its height from the level of the ground is above 70 English feet. The lower or ground story is adorned with pilasters, and the upper with Tuscan or Doric columns. The attic shows the holes destined to receive the posts on which was stretched the awning that covered the amphitheatre. The rows of seats are computed to have been originally thirty-two in number. There were four principal entrances. The amphitheatre has been computed to hold 17,000 persons: it was built with great solidity without cement: the stones were quarried in the neighbourhood, and some of them are of immense size. When the Visigoths possessed Nîmes, they converted this building into a fortress, to defend the place against Clovis and his Franks. They built the square towers which yet remain near the eastern door. It was defended by the Saracens against Charles Martel, who assailed it with fire, of which it still exhibits the traces. Under the viscounts of Nîmes it was still kept as a fortress. The arena was encumbered till of late years with a parcel of wretched hovels, now removed.

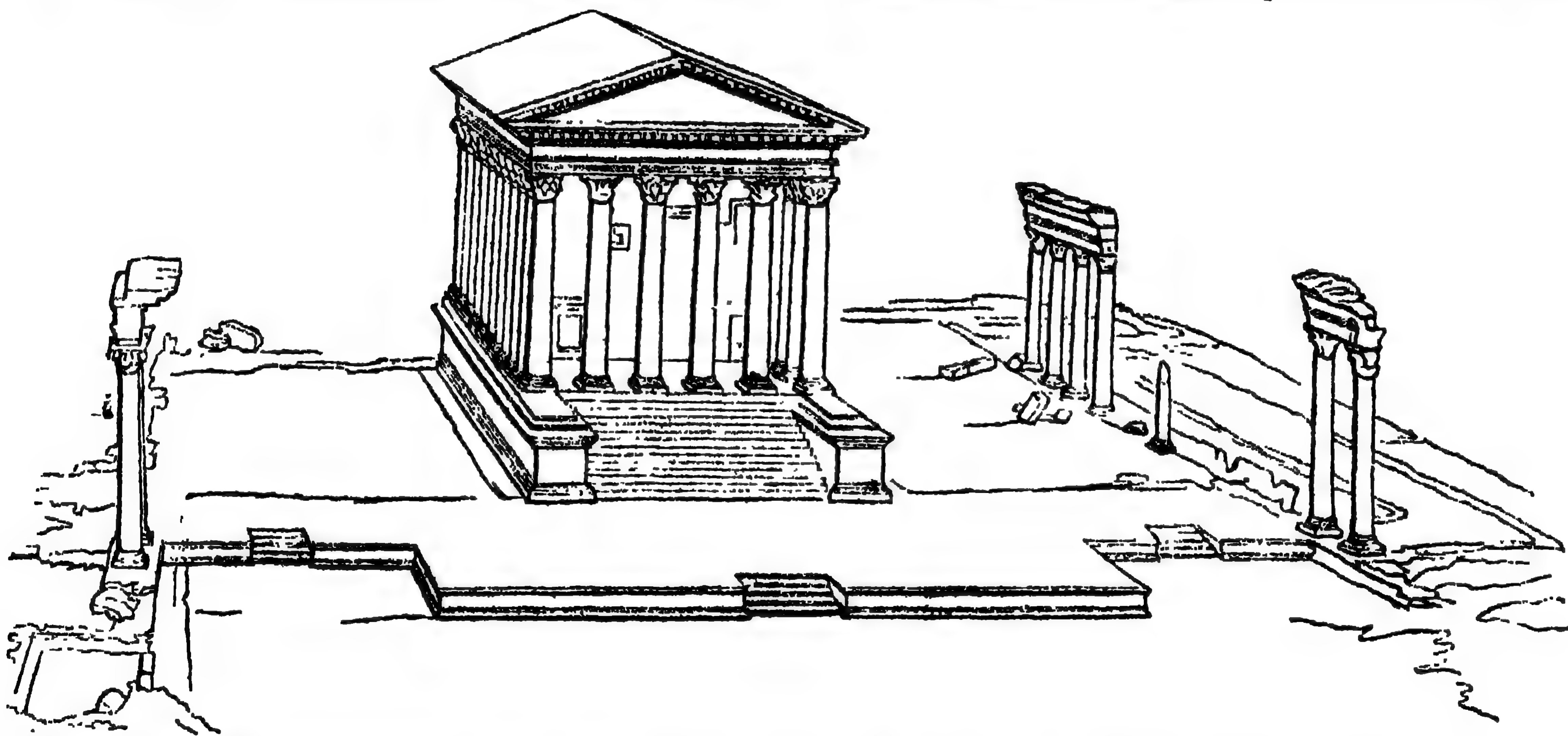
There is an antient edifice which antiquaries have designated the temple of Diana; it is of moderate dimensions, and is built of large stones without cement; but the violence which has been offered to it at different times has reduced it to a mere ruin. The interior still exhibits some remains of a fine vaulted roof and of the niches and columns which once adorned it. A number of inscriptions, capitals, and other fragments of columns, or of different parts of the building, statues, and other antiquities, are confusedly heaped together in this building. The adjacent baths of Diana, and the fountain which supplied them, have disappeared or lost their antique character under the more modern works which have been added to them. The waters of the fountain are conveyed by a canal round one of the public gardens of the modern town, and the place of the baths is occupied by statues and groups in marble, of modern date and inferior execution.

Near the temple of Diana is a singular edifice called La Tour-magne, Turris Magna, 'the great tower.' It consists of a lower story of heptagonal form, 245 French, or 262 English feet in circumference; and of an upper story, an octagon, of 107 French, or 115 English feet in circumference. It is 117 French, or 125 English feet high; but the ruins which surround it much diminish its apparent height. It is built of small square stones, and each front was originally adorned by two pilasters of freestone, Tuscan or Doric. It stands on an elevation, and joined the antient walls of the town; but its origin and use are both entirely unknown.

There are two Roman gates; one is called the gate of Cæsar, and was discovered A.D. 1791, on the demolition of some antient ramparts erected in the twelfth century. This gate is built of large blocks of freestone, and has two large arches in the middle, and two smaller arches, one on each side. It bears an inscription, showing that the gates and walls were the gift of Augustus Cæsar to the colony. The inscription is IMP. CAESAR DIVI. F. AVGVSTVS . COS XII. TRIBV. POTEST. VIII.; and in smaller letters, PORTAS. MVROS. COL. DAT; from which we learn that at this date Nîmes was a Colonia: indeed, Augustus is considered as the founder of the colony. The other Roman gate is far inferior.

Besides these more important remains Nîmes has a vast number of inscriptions, monumental and other, and one or two fine mosaic pavements: in the neighbourhood there is a Roman bridge.

Nîmes is situated in a delightful plain at the foot of hills



A bird's-eye view of the Corinthian Temple at Nîmes, called the Maison Carrée, with the remains of the Colonnade which once surrounded it.—From the beautiful model by M. Pelet of Nîmes, made during the recent excavations from the year 1822 to the year 1838. N.B. The columns and fragments have not been re-erected, but lie round the area. (Drawn by W. B. Clarke, Nov. 1838.)

covered with vineyards and olive-gardens. The city, properly so called, has narrow, crooked, and ill-built streets; it is surrounded by boulevards, which occupy the site of the antient ramparts, and separate the city from its suburbs, which at least equal it in extent, and have straight, wide, and long streets, but the houses are ill built. The boulevards are receiving continual accessions of embellishment from the erection of new and handsome buildings. Of the public edifices the most remarkable are Le Palais de Justice (the court-house), the hospital, the theatre, the cathedral, the college church, and le Dépôt de Mendicité, or poor-house. Le Palais de Justice fronts the boulevard of the esplanade, and is a handsome specimen of Grecian Doric. The hospital fronts another of the boulevards, and is remarkable for the tedious uniformity of its extended front; the theatre is on the same boulevard as the hospital. The cathedral is a Gothic building, and contains some interesting monuments, among them that of Fléchier. Some of the additions to this building are remarkable for their incongruity, being of Greek architecture. The college church is a handsome building of modern date. The Dépôt de Mendicité is established in a fortress, built by Louis XIV., on the ruins of a Huguenot church.

Nîmes has long been an important manufacturing town. Before the Revolution it had a population of 50,000, but the troubles of that period, and the injury to trade which resulted from the long wars that followed, considerably affected it. In 1826 it had 40,000 inhabitants; in 1831 there were 39,639 inhabitants in the town, or 41,266 in the whole commune; in 1836 there were 43,036 in the commune. The principal manufacture is that of fancy silk goods, silk stockings and caps, and other articles, which are made in great abundance and at low price. In quality the goods are not considered equal to the fabrics of Lyon or the silk stockings of Ganges. A considerable quantity of printed cottons, shawls, Madras handkerchiefs, chintzes,

and sewing and embroidering silk, is also manufactured. There are several dye-houses and tan-yards, and the town is the great market for the raw silks of the surrounding district. Brandy is distilled and vinegar manufactured. The surrounding hills produce the vine, the fig, the olive, the pomegranate, the almond, and a great number of aromatic herbs; the plains yield pasturage, corn, and vegetables. The town carries on considerable trade in these various productions; in wine, spices, drugs, essences, silks raw and wrought; also in the oleaginous seeds, medicinal plants, and those used in dyeing. The merchants have connections with most of the great towns of Europe, but especially with Amsterdam, Hamburg, Lübeck, and other places in the north. There are two fairs in the year, but they are of short duration and little importance.

Nîmes is the seat of a bishopric: the diocese comprehends the department; and the bishop is a suffragan of the archbishop of Avignon. It has a Cour Royale, the jurisdiction of which extends over the departments of Gard, Ardèche, Lozère, and Vaucluse; and there are subordinate judicial courts and several fiscal or administrative government offices. It has an Académie Universitaire, a Collège Royale or high school, an Académie Royale for the department, a cabinet of natural history, a course of instruction on chemistry as applied to the arts, a public library of 10,000 (or, according to M. Millin, 30,000) volumes, an agricultural society, a society of medicine, a commission of antiquities, and a Bible society. Elementary instruction is considerably diffused. There are several cabinets of antiquities, of which the principal is that belonging to the high school, which contains more than 8000 medals.

Nîmes has been the birth-place of several men of eminence; among them are the Greek scholar Cotelier (Cotelerius); the learned Petit and Seguior; Saurin, an eminent preacher among the Huguenots; and Rabaut de St. Etienne, one of the victims of the Revolution.

The arrondissement of Nîmes comprehends an area of 650 square miles, and contains 72 communes. It is divided into eleven cantons or districts, each under a justice of the peace. The population in 1831 was 128,461; in 1836, 131,712.



Bronze Coin of Nîmes, from the Museum of Avignon. (Drawn by W. B. Clarke.)

This coin is the celebrated 'Pied de Biche,' which is very rare. There is a similar coin which is so common that it is often found current with the copper money of France. The two heads are said to be those of Agrippa and the Emperor Augustus: that on the right hand is Augustus, and that on the left is Agrippa. The inscription is read, 'Imperator Divi Filius Pater Patriae.' The crocodile chained to a palm tree, surmounted by a streamer, is said to commemorate the victory of Actium and the subsequent reduction of Egypt, of which the crocodile is the symbol. The words Col. Nem. (Colonia Nemausus) refer to the founding of the colony by Augustus. (Rasche, *Lexicon Rei Numariae.*)

NIMWEGEN, or NYMEGEN, is a strongly fortified town in the province of Guelderland, in the kingdom of the Netherlands, in 51° 51′ N. lat. and 5° 52′ E. long. It is on the left bank of the Waal, and is built partly on some hills, and partly on the level ground between the hills and the river, over which there is a flying bridge. It is not ill built, yet the streets being narrow, and the houses rising above and overlooking each other, owing to the steep ascent of the hills, the town has an irregular appearance. The inhabitants amount to 17,300. Their chief occupations are tanning, bleaching, glue-making, and especially brewing a peculiar kind of pale beer called Moll, large quantities of which are exported. They manufacture common brass snuff-boxes, and have a good commission trade. They show an old edifice, now forming part of the fortifications, which is supposed to be of Roman origin; and in the town-hall (which is a handsome building) there is a large collection of Roman antiquities. Nimwegen is supposed to be on the site of the Roman Noviomagus. Of the nine Calvinist, Lutheran, and Roman Catholic churches, some are worthy of notice. On an eminence near the river stand the ruins of an antient castle called the Falkenhof, which is said to have been built by Charlemagne, and was the residence of the kings of the Franks. Two public promenades, the Katverbosch and the Belvedere, are much frequented on account of the extensive views which they command of the course of the river and of the surrounding country.

Nimwegen, having joined in 1579 the union of the northern provinces, was besieged and taken by the Spaniards in 1585, but recovered in 1590 by prince Maurice of Nassau. In 1672 the French obtained possession of it without resistance; and in 1678 the treaty of peace was concluded here between France, Spain, and the United Provinces, by which it was restored to the Dutch. In 1702 the French made an unsuccessful attempt to surprise it. During the war of the Revolution it was taken by the French, on the 8th of September, 1794, after a severe action, in which the allies were defeated.

NINEVEH (נִינְוֵה, LXX., Νινευΐ, Νινευή), called by the Greeks and Romans Ninus (Νῖνος), the capital of the Assyrian empire, was situate in the plain of Aturia, on the Tigris (Strabo, xvi. 737; Herod., i. 193; ii. 150; Ptolem., vi. 1) and not on the Euphrates, as Diodorus states on the authority of Ctesias (ii. 3, 7).

The Hebrew and Greek writers concur in describing Nineveh as a very large and populous city. Jonah speaks of it as 'an exceeding great city of three days' journey' (*Jon.*, iii. 3), and states that there were more than 120,000 persons in it that knew not their right hand from their left (iv. 11). Rosenmüller and other commentators suppose this to be a proverbial expression to denote children under the age of three or five years, and accordingly estimate the entire population at two millions; but the expression in Jonah is too vague to warrant us in making such a conclusion. Strabo says that it was larger than Babylon (xvi. 737); but if any dependence is to be placed on the account of Diodorus (ii. 3), who states that it was 480 stadia in circumference, it must have been about the same size as Babylon (Herod., i. 178.) The walls of Nineveh are described by Diodorus as 100 feet high, and so broad that three chariots might be driven on them abreast. Upon the wall stood 1500 towers, each 200 feet in height, and the whole was so strong as to be deemed impregnable. (Diod., ii. 3; *Nahum*, chap. ii.)

According to the Greek writers, Ninus was founded by a king of the same name; but in the book of *Genesis* it is only stated to have been built by the Assyrians, which appears to be the meaning of the passage in *Gen.*, x. 11. It was the residence of the Assyrian kings (2 *Kings*, xix. 36; *Isaiah*, xxxvii. 37; compare Strabo, ii., p. 84; xvi., p. 737), and is mentioned as a place of great commercial importance; whence Nahum speaks of its merchants as more than the stars of heaven (iii. 16). But as in the case of most large and wealthy cities, the greatest corruption and licentiousness prevailed, on account of which Nahum and Zephaniah (ii. 13) foretold its destruction.

On the dissolution of the great Assyrian monarchy, in the eighth century B.C., Nineveh was taken by the Medes under Arbaces, in consequence of the river demolishing part of the wall; when it is said to have been destroyed. (Diod., ii. 26-28.) [ASSYRIA.] But it appears to have still existed as the capital of an Assyrian kingdom till B.C. 625, when it was taken by the Medes under Cyaxares. (Herod., i. 106.) The prophecy of its destruction by Zephaniah must refer to its capture by the Medes. Strabo also says that it fell into decay immediately after the dissolution of the Assyrian monarchy by the Medes (xvi., p. 737); and this account is confirmed by the fact that in the history of Alexander the Great the town is not mentioned, although in his march along the banks of the Tigris, previous to the battle of Gaugamela, he must have been very near the spot where it is supposed to have stood. Under the Roman emperors however we read of a town Ninos (Tac., *Ann.*, xii. 13), or Ninive (Ammian. Mar., xviii. 7); and Abulfaraj in the thirteenth century mentions a castle Ninivi.

According to Abulfaraj and the general testimony of Oriental tradition, most modern writers suppose Nineveh to have been situated on the left or east bank of the Tigris, opposite Mosul [MOSUL] and partly on the site of the mo-
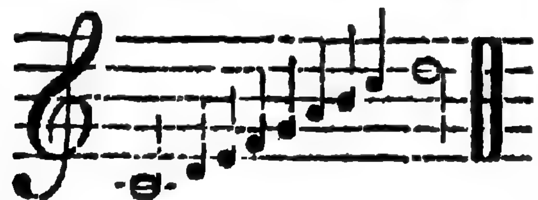
dern village of Nunia, or Nebbi Yunus, which contains about 300 houses. (Rich.) From the account of Niebuhr, and more especially of Rich, it appears evident that there must have been formerly a large city on this spot; though it is difficult to determine whether the ruins described by these travellers are the remains of antient Nineveh or of a city built in after-ages. At first sight the ruins of Nineveh present the appearance of a range of hills; but from all these hills large stones, frequently with bitumen adhering to them, are constantly dug out in great numbers. The bridge over the Tigris is said by Rich to have been entirely built of stones dug out of the ruins of Nineveh, which, he adds, is an inexhaustible resource. On the largest of these hills or mounds there is a celebrated mosque, which is supposed to cover the tomb of Jonah. The walls and ditches which surrounded part of the city may still be traced very clearly in many parts. Rich calculated the area enclosed by these walls at from one and a half to two miles broad, and four miles long, extending a little way south of Nebbi Yunus; and he observes that on the river or west side there are only remains of one wall, as well as on the north and south extremities, but that on the east side there are remains of three walls. It is also his opinion that the part enclosed by these walls formed only 'a part of a great city, probably either the citadel or royal precincts, or perhaps both, as the practice of fortifying the residence of the sovereign is of very antient origin. In the East to this day the dwelling of the prince, and indeed of many governors, consists of a number of buildings enclosed in quite a separate quarter; and from what we are told of the Babylonian palaces, and see of that of the Siffiviyahs and of the sultan of Constantinople, this extent would not be too much to assign for the residence of the Assyrian kings.' There are very few traces of ruins outside these walls; but they may probably exist to a greater extent than has yet been supposed, since Rich relates that some people who been digging for stones in a place outside the enclosure, where it would have been impossible to have known from the appearance of the surface of the ground that there had been buildings beneath, found many huge stones laid in layers of bitumen and lime mortar.

Fragments of bricks, whole bricks, and pieces of gypsum, covered with inscriptions in the cuneiform character similar to the inscriptions at Babylon, are frequently found.
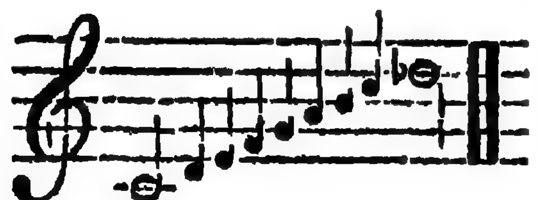
(Winer's *Biblisches Realwörterbuch*; Rosenmüller's *Handbuch der Biblischen Alterthumskunde*; Niebuhr's *Travels*; Rich's *Narrative of a Residence in Koordistan, and on the Site of antient Nineveh*; and the authorities cited in this article.)

NINTH, an interval in music, a discord retarding the 8th, but may be resolved into either the 6th or the 3rd; and though this is the octave of the 2nd, yet it is essentially different in harmony, both as to treatment and effect. [CHORD; THOROUGH-BASE.]

Of this interval there are two kinds; the major 9th, composed of six tones and two semitones—



and the minor 9th, composed of five tones and three semitones—



NINUS. [NINEVEH.]

NIO, IOS, one of the Cyclades, situated five miles south by west of Naxos, and ten miles north by west of Thera or Santorini. Nio is about nine miles in length and five in its greatest breadth, which is towards the middle of the island. The surface is hilly, but not so rocky or barren as most of the smaller Cyclades. The chief produce is corn, which is of good quality, but the island is deficient in fruit and other trees. The present population, according to Thiersch, is about 2200. The town, called also Nio, is built on a hill on the western coast, above a bay in which there is good anchorage and a fine spring of water issuing out close to the shore. On the eastern coast is another good harbour, called Manganuri. The pilots of Nio are reckoned among the best in the Archipelago. Whilst under the Turks, the harbours of this island were a favourite place of resort for the pirates who infested the seas of the Levant.

Nio was called Ios by the antient Greeks, in consequence, it is said, of having been colonised by the Ionians, before which, according to Pliny (iv. 12) and Stephanus of Byzantium, it was called Phœnicia, from the palm-trees which grew on the island, but which have long since disappeared in the same manner as at Delos and other places, where the palm-tree was also found in antient times. (Spon; Tavernier.)

Strabo, Pliny, and Pausanias speak of the tomb of Homer being at Ios; and the author of the Life of Homer, attributed to Herodotus, reports the epitaph of the poet. The story is that Homer, coming from Samos to Athens, stopped at Ios, which was the native country of his mother, and was there taken ill and died; and the author of the Life above mentioned says that some of the inhabitants of the town, which was built on a mountain, used to come down every day to the sea-coast to attend on the poet during his illness. Tavernier found no antient monuments on the island, but he mentions a medal of Nio in the French king's cabinet, with the head of Jupiter on one side, and on the other that of Pallas with a palm-tree, bearing the legend ΙΗΤΩΝ.

During the middle ages Nio formed part of the duchy of Naxos, founded by the Venetians, but John Crispus, the twelfth duke, detached it from the duchy, and gave it as a separate principality to his brother Marcus, who built a castle on the summit of the hill, round which the modern town of Nio has grown. Marcus also called in many Albanian families to cultivate the soil. His only daughter Adriana Sanudo having married Louis Pisano, a Venetian noble, the dominion of the island passed into and remained with the latter family, until the island was taken by the Ottomans. (Dapper; Tavernier.) It now forms part of the kingdom of Greece.

NI'OBE, the daughter of Tantalus, king of Lydia, was married to Amphion, by whom she had, according to Ovid and other antient writers, seven sons and seven daughters. This is the most commonly received opinion, though Homer (*Il*, xxiv. 602, &c.) and others give the numbers variously. The pride of Niobe at having this numerous progeny was so great that she is said in antient story to have insulted Latona, the mother of Apollo and Diana, by refusing to offer at the altars raised in her honour, declaring that she had a better claim to worship and sacrifices than one who was the mother of only two children. Latona, indignant at this insolence and presumption, called upon her children to revenge her, and punish the arrogance of Niobe. Apollo and Diana heard the prayer, and obeyed the entreaty of their outraged parent. All the sons of Niobe fell under the arrows of Apollo, while the daughters in like manner met their death from the hands of Diana. Chloris alone escaped the common fate. She was the wife of Neleus, king of Pylos. This terrible judgment of the gods so affected the now heart-stricken and humiliated Niobe, that she was changed by her excessive grief into stone on Mount Sipylus in Lydia. Pausanias says (i. 21, 3) that the rock on Sipylus, which went by the name of Niobe, and which he had visited, 'was merely a rock and precipice when one came close up to it, and bore no resemblance at all to a woman; but at a distance you might imagine it to be a woman weeping with downcast countenance.'

The fable of Niobe and her children has afforded a subject for art, which has been finely treated by one of the greatest antient masters of sculpture. It consists of a series, rather than a group, of figures of both sexes, in all the disorder and agony of expected or present suffering; while one, the mother, the hapless Niobe, in the most affecting attitude of supplication, and with an expression of deep grief, her eyes turned upwards, implores the justly offended gods to moderate their anger and spare her offspring, one of whom, the youngest girl, she strains fondly to her bosom. It is difficult by description to do justice to the various excellence exhibited in this admirable work. Its great merit is independent of fine execution, in which it is inferior as a whole to many other well-known productions of the Greeks. Its excellence consists in the finer qualities of sentiment, as expression, grace, propriety, and variety of action, with that unity of effect by which the scene is brought dramatically and at the same time truly before the spectator, and a story of the most affecting interest told in language that cannot be mistaken. The arrangement of the composition is supposed to have been adapted to a tympanum or pedi-

ment. The figure of Niobe, of colossal dimensions compared with the other figures, which are life size, forms, with her youngest daughter pressed to her, the centre; while the rest of the sons and daughters are ranged in various ways on each side, some exhibiting expression of fear, others agonised with pain, others in grief, while one of the sons lies dead or dying, and stretched upon the ground. All are graceful, and some of the figures possess also great beauty, and the action and expression of many of the heads offer admirable examples for study to the artist. The whole attitude and expression of Niobe herself may truly be called sublime. An eminent professor has observed of this figure, 'The character of the head, though indicative of a more matured age and less delicate than the daughters, still presents an image of the most attractive beauty; while grace, sentiment, and dignified simplicity reign throughout the figure.'

The colossal scale of the principal figure has justly been objected to as a fault. The artist doubtless had two purposes in view when he ventured on this deviation from truth. The first was the necessity which he felt of giving a superior height and volume to the apex and key, as it were, of his composition; and next perhaps the desire he had to concentrate the interest in his chief figure by forcing it thus upon the attention. But although we should hesitate before taking any exception to the practice of the great leaders and masters of art, yet, generally speaking, any departure from the truth of nature—the real canon of excellence when rightly studied—is so far from being commendable or admissible, that, where it has been indulged in by the antients with the view of gaining greater effect and energy, it may usually be considered rather as evidence of their inability to work out their idea with the authorised means, than as a practice to be admired or imitated; and it may always be argued that they would have been so much the more entitled to our admiration if they had produced their works within those limitations which nature dictates. The productions which exhibit these faults, for they must be accounted so, will be found to be worthy of the high estimation in which they are held for other properties, and rather in *spite of* than *because of* the licence which their authors have allowed themselves.

The execution of this interesting monument of Greek art is attributed by some to Scopas, a native of Paros, who lived about 300 years before the Christian æra; while others think it is the production of Praxiteles. Pliny says it was a question which of the two was the author of it. The group was in the temple of Apollo Sosianus at Rome. (Plin., *Hist. Nat.*, xxxvi.; Sillig., *Catal. Artificum*, in verb.)

Flaminio Vacca says the group of Niobe and her children was found at Rome, but *outside* the walls, near S. Giovanni; but the learned antiquary Fea denies this, and says it was found near the Villa Altieri. The well known statues of the 'Boxers' were discovered at the same place, and it has been supposed by some that they formed part of the group; the fable being that some of the children of Niobe were slain while thus exercising. (Winckelman, *Sur l'Allegorie*, pref.)

All the above statues are in marble, and are now at Florence in the gallery of the grand-duke of Tuscany; but many of them are thought to be copies only, from originals now lost. There is in England a head of Niobe, which is engraved in the 'Select Specimens of Sculpture,' published by the Society of Dilletanti (vol. i.), similar in action and expression, but preferable, for its style and execution, to that of the Florence statue; and as there are known repetitions of some of the other figures, it is not improbable that the principal and most interesting of the series may also have been frequently copied, and that the figure in the grand-ducal collection, though an antient work, may come under this class.

The subject of Niobe and her children was a favourite one also with the poets of antiquity. Besides the beautiful story in Ovid (*Metam.*, vi. 146), there are numerous epigrams in the Greek Anthology, several of which have great merit, and appear to be descriptive either of the group of figures which still exists, or of some similar group. See particularly that beginning—

Ταντάλι παῖ Νιόβα, κλῦ' ἐμὰν φάτιν ἄγγελον ἄτας.

For further information and references as to the group of Niobe, see Thiersch, 'Ueber die Epochen der Bildenden Kunst,' &c., pp. 368, &c.

NION, or NYON. [WAADT.]

NIONS, or NYONS. [DRÔME.]

NIORT, a city in the west of France, capital of the department of Deux Sèvres, situated on the bank of the Sèvre Niortaise, in 46° 13′ N. lat. and 29′ W. long.; 218 miles from Paris in a direct line south-west, or 260 miles by the road through Versailles, Chartres, Tours, and Poitiers.

Niort was included in Poitou, and was formerly, with the rest of that province, in the power of the English, from whom it was taken by Philippe II. Auguste, early in the thirteenth century. It subsequently fell again into their hands, and was retained by them for several years. The town is situated in a delightful and well cultivated district, and is built on the slope of two hills and on both sides of the river. It was formerly one of the most wretched looking towns of the district, but the new buildings which have taken the places of the former miserable houses have given it a much better appearance; it is now well laid out, and tolerably well built. The town-hall is a very antient building, once the palace of Eleanor of Guienne, wife of Henry II. of England; there are two churches, one of them an antient Gothic building with a fine spire raised by the English; barracks for cavalry; and an antient castle, which is now used as a prison. The town has two good places or squares, and there is a pleasant promenade near the barracks.

The population of the commune in 1826 was 15,799; in 1831, 16,175 (of which 15,832 were in the town); and in 1836, 18,197. The chief manufactures are chamois and other leather, gloves, shoes, woollen and cotton yarn, druggets and other woollens, saddles, braces, combs of horn and box wood, paper, saltpetre, and confection of angelica.

Considerable trade is carried on in Bordeaux and other wines, in cask-staves and timber for building, in corn, in flour, produced in the surrounding country and sent to the ports of Rochelle and Rochefort, and in wool and hair. There are three fairs in the year, of eight days each, at which a great number of cattle, horses, and mules are sold. Stone is quarried in the neighbourhood. The navigation of the river Sèvre commences at Niort.

There are several government offices for fiscal or administrative purposes; two hospitals, a poor-house, and a maternity society; a handsome theatre; a public library of 15,000 volumes; a Royal Athenæum of sciences and arts; a high school, to which are attached a museum of natural history and a philosophical apparatus; a free drawing-school, and a departmental nursery combined with a botanic garden.

Madame d'Aubigné, better known as Madame de Maintenon, was born in the prison of this town, where her father was confined as a state prisoner. Isaac de Beausobre and Louis de Fontanes were also born at Niort.

The arrondissement of Niort comprehends an area of 556 square miles, and contains 94 communes: it is subdivided into ten cantons or districts, each under a justice of the peace. The population in 1831 was 97,222; in 1836, 100,208.

NIPHON, or NIPON. [JAPAN.]

NISCHNEI-NOVGOROD, that is, Lower Novgorod, or Nischegorod, a government of Great Russia, is situated between 54° and 57° N. lat. and 41° 45′ and 46° 15′ E. long. It is bounded on the north by Kostroma, on the north-east by Wiätka, on the east by Casan, on the south-east by Simbirsk, on the south by Perm, on the south-west by Tambow, and on the west by Wladimir. The area is 20,180 square miles, and it is divided into eleven circles.

Face of the Country; Soil; Climate.—The country is an undulating plain, diversified only by the high lands along the banks of the rivers and by small elevations. There are very extensive plains, uninterrupted by any irregularity of surface. There is also a considerable extent of forest, but only few swamps. The soil consists in a great measure of sand, with a mixture of good earth; and in many places it is covered with a thick layer of black mould; here and there clay is found, with portions of iron or ochre. The hills, none of which are more than from 400 to 600 feet above the level of the sea, generally consist of clay, gypsum, and limestone, and occasionally of sandstone: they are all covered with forests. The principal river is the Wolga, which enters the government from Kostroma, and flows thence to Casan in a semicircular bend. This great river, in its course through the government, receives the following rivers: the Oka, which, rising in Orel, flows through that government, and those of Tula, Kaluga, Riäsan, Moscow, and Wladimir, and, after a course of 340 miles through the most fertile parts of Russia, falls into the Wolga near Nischnei-

Novgorod; and then the Kulma, the Kirsenez, the Sura, a rapid river navigable only in the spring, the Worluga, and the Alatyr. There are few lakes, and none of them are large. The climate is milder than in Wladimir; there is not so much moisture, and spring and autumn are not so variable. The inhabitants are very long lived, and the number of births is often nearly double that of deaths.

Natural Productions.—Nischnei-Novgorod is one of the most fertile and productive provinces of the empire. The inhabitants grow rye, some buck-wheat, millet, peas, and beans, and large quantities of flax and hemp. All the vegetables of Northern Russia are cultivated in the gardens, especially cabbages, carrots, turnips, onions, cucumbers, and pumpkins, likewise abundance of hops, and some fruits, such as apples, cherries, pears, and plums; but the two last are not so good as the others. The forests are very productive; the banks of the streams and rivers are clothed with the finest timber, especially oak and lime trees. The pine, the fir, the beech, and the alder are found in all the forests. The oaks however have been very much thinned; and the great extent of the forests has led to the most extravagant waste. It was not till 1802 that regulations were made for the management of the forests belonging to the crown; but Hassel, in 1821, complains that the undefined privileges of the distilleries, the potash manufactures, and the glass and iron works, are an obstacle to anything like system. In the vicinity of the crown villages in particular, the waste is frightful, and even in the crown forests, from which the admiralty obtains the best timber for the navy, no care is taken to make new plantations. Only the Mordwins, who have inherited from their pagan forefathers a religious reverence for fine lofty trees, take some care of their forests. It does not appear that a better system has been since introduced, for Schubert, in 1836, says, 'no bounds have yet been set to the waste of timber.' The breeding of cattle, though subservient to agriculture, is very carefully attended to. The best horses of the Russian breed are found in this province, where the government and many private persons have studs. The horned cattle are handsome and of a large size. Sheep and hogs are of the common breed. Some poultry, especially geese, abound; bees also are common. The principal fish in the rivers are the bleak, the isinglass fish, and the caviare sturgeon, of which there is a sufficient supply for home consumption.

Manufacture and Trade.—Of all the governments of Russia, Moscow and Wladimir not excepted, Nischnei-Novgorod is that in which the inhabitants are the most generally engaged in manufactures of various kinds, though the province has comparatively few manufactories on an extensive scale. But most of the villages are full of artisans and little manufacturers of all descriptions, who, without belonging to a manufactory, yet make a great abundance and variety of articles. There are also in the country many who carry on some business on a large scale, though it is considered as only a secondary employment; so that weaving mats, making potashes, spinning yarn, linen weaving, and making earthenware, are common all over the country. The few large establishments manufacture woollen cloth, leather of various kinds, linen, Russia duck, cordage, soap, candles, iron, steel, and glass wares.

The exports of the province consist of corn, flour, hemp, flax, yarn, coarse linen, cordage, bass mats, leather, carved and turned wooden wares, oak timber, potashes, cooper's work, iron wire, hardware, glass, cloth, horses, and some other trifling articles, which amply suffice to counterbalance the imports, which are chiefly bar iron, salt, brandy, wine, colonial produce and manufactures.

The population of the province is now nearly a million and a half. The inhabitants consist, 1, chiefly of Russians; 2, Tschuvasches; 3, Mordwins; 4, Tscheremesses; and 5, of some Tartars. The Tschuvasches and Mordwins are probably the original inhabitants, but at present both together hardly amount to 60,000: they however retain their peculiar dialect, and in some degree their antient customs and manners; both they and the Tscheremesses are of Finnish origin. The Greek church predominates, and is under the bishop of Nischnei-Novgorod. The Mordwins and Tscheremesses are most of them baptised, as well as many of the Tschuvasches, but a great portion of the latter are still heathens. They do not worship their gods in temples, but in consecrated places in the open air, which they call Keremet or Irsan, and which are chiefly in groves and forests. They have a supreme god, whom they call Thor, and whom, as well as the inferior gods, they worship as an invisible being; they offer sacrifices to him, believe in a state of future rewards and punishments, and have their priests and conjurors, whom they call Juma and Jömme.

NISCHNEI-NOVGOROD, the capital of the government, is in 50° 20′ N. lat. and 44° 28′ 36″ E. long., at the confluence of the Oka and the Wolga. It consists of three parts. 1. The fortress, at the top of a hill, which is 5665 feet in circumference, is surrounded with a wall which has five square and two round towers, several of which are in a state of decay, and two gates. In this fortress are the two cathedrals dedicated to St. Michael and to the Transfiguration, the palaces of the governors, and some other public buildings, and an obelisk of granite 46 feet high, in honour of Minin and Poscharsky. 2. The city itself is situated on the declivity of the hill on the Wolga, which is pretty well built in the Russian fashion: the streets indeed are narrow, but there is a large open market-place and a fine quay. 3. The suburb, which twenty years ago consisted entirely of wooden houses, but has been since much improved.

This city is the residence of the military governors of Perm and Nischnei-Novgorod, of the civil governor of the latter, the see of the bishop, and the seat of the various public offices. The public buildings and institutions are, 42 churches, of which 30 are of stone, 3 convents, a seminary for schoolmasters, a gymnasium, several schools, a Bible Society, a very fine stone bazaar, and 2200 booths or stalls of wood. The population in 1836 was 24,995, but the domes and steeples of the numerous churches give it the appearance of a much more considerable town. The inhabitants carry on various manufactures of cordage, leather, coarse lace, cloth, copper and iron articles, soap, and candles, and there are many malt-kilns, breweries, and tanneries. But the great and annually increasing importance of Nischnei-Novgorod arises from its fair, of which, as it begins to be much frequented by English merchants, we shall give a rather detailed account, entirely drawn from Russian official statements.

The great annual fair of this part of Russia was established by the Czar Alexis Michailovitsch in 1648, at Makarieff, at which time its duration was limited to five days. New regulations were promulgated in 1679, 1680, 1681, and 1691, by the last of which every facility was granted to foreigners. In 1750 the fair had become so considerable, that the government built a vast bazaar of wood, containing 800 shops; but the quantity of goods brought from Europe and Asia increased every year in such a degree, that the old bazaar could not contain half of them, and in 1809 the emperor Alexander ordered a new building to be erected, which contained 1400 shops. But even this bazaar was soon insufficient, and a great portion of the goods were placed under sheds, the number of which it was necessary to increase every year, till they at length amounted to 1800, the rent of which and that of the shops in the bazaar produced annually 120,000 rubles.

The government had devoted a sum of 600,000 rubles to the erection of this building, which was scarcely completed when it was totally destroyed by a dreadful fire on the 18th August, 1816. The emperor Alexander immediately gave orders for the erection of a more solid and secure edifice: at the same time it was thought desirable to remove the fair to some other place which should afford the merchants greater facilities of communication, and for unloading and loading boats, than Makarieff. The choice happily fell on Nischnei-Novgorod, which is in the centre of that immense system of inland navigation which covers Russia as with a net, and affords a communication from this point with the two capitals, with the White Sea, the Gulf of Finland, and the Caspian. A kind of peninsula opposite the city, on the left bank of the Oka, formed by that river on the south, the Wolga on the east, and lake Mestcherskoe, which has a communication with the Wolga a little farther to the north, was chosen for the site of the new bazaar. It was necessary first of all to raise the ground, which was inundated every spring by the Wolga: to procure earth for this purpose, and likewise to facilitate the movement of the boats, a broad canal, in the form of a horse-shoe, was dug, the two extremities of which join the Oka, while on the other side it communicates by means of lake Mestcherskoe with the Wolga.

On the plateau enclosed by this canal there is now a whole town of stone magazines, built in the form of a large

oblong parallelogram, surrounded with shops, before an edifice adorned with three rows of columns, which is the hotel of the governor, in which the local authorities reside during the fair. Forty-eight blocks of buildings, separated by streets which intersect each other at right angles, extend behind this parallelogram. The number of the shops is about 2524, and over each there is a small apartment, in which the merchant may reside. All these buildings are roofed with iron, and the coverings of the open galleries which run along all the façades are likewise of iron, and supported by eight thousand elegant cast-iron pillars. A very broad street, passing through the centre of this commercial town, terminates in a church built in a noble and rich style. A little before the church, in two transverse ranges on the right and left, are the Chinese shops, the fantastic architecture of which, their turned-up roofs, surmounted with flags and long streamers which are moved by every breath of air, give a variety to the appearance of these immense edifices. On the same line, beyond the canal, there is on the west an Armenian church, and on the east a mosque. The remainder of the peninsula beyond the canal round the above-mentioned mosque is occupied by a great number of wooden booths, in which are deposited goods less liable to spoil, such as iron, leather, cordage, &c. There too are the theatre and the numerous tents of the Tartar *restaurateurs*. An island in the Oka, between the town and the fair, is covered with similar booths.

All this vast, regular, and handsome town of warehouses, the erection of which cost eleven millions of rubles, presents for ten months in the year the silence of a desert; but scarcely is the flag announcing the commencement of the fair hoisted on the 29th of June, when all the streets and warehouses are filled with a countless multitude who have flocked hither from the two Russian capitals, from all our manufacturing towns, from the shores of the Baltic and the Caspian, from Bokhara, Khiva, Kokand, and Taschkend, from Asia Minor, from the mountains of Turkistan and the frontiers of China, and, of late years, from different parts of Western Europe. All these magazines and booths are filled with the produce of the most diverse countries, and thousands of boats are employed in landing the goods, or in taking them on board to convey them to the seas which wash the northern and southern shores of the empire. Other goods, such as wooden wares, are piled up even in the open country, and farther on are long lines of carts with their horses, which serve both as magazines, and lodgings for the country-people.

The following table shows the gradual increase of the business done at the fair from 1830 to 1837 inclusive:—

Years.	Value of Goods for sale. Rubles.	Value of Goods sold. Rubles.	No. of Warehouses and Booths let.	Total of Rents. Rubles.
1830	106,107,990	91,281,946	3711½	422,876
1831	129,407,700	98,229,925	3525	401,060
1832	138,207,618	116,158,508	3643	408,807
1833	146,135,681	117,210,676	3893¼	429,528
1834	140,474,355	107,693,395	3868¾	421,308
1835	142,591,640	116,965,740	3961½	428,402
1836	148,955,595	126,514,046	4149	441,877
1837	146,638,181	125,567,881	4141¼	450,981

Though the crisis which was felt in all the commercial cities of Europe had some effect on the fair in 1837, the result was nearly equal to that of 1836, and with respect to Russian manufactures of cotton, silk, and wool brought to the fair, the quantity was greater than ever. The value of Russian manufacturers exposed to sale and sold was as follows:—

	Exposed to Sale. Rubles.	Sold. Rubles.
Cotton manufacture	27,742,570	22,234,570
Woollen do.	11,008,600	8,921,600
Hemp and flax do.	4,906,250	[illegible],981,250
Silks	9,316,200	6,744,200
Furs	7,496,080	6,021,080
Leather and leather manufactures	2,224,360	1,688,360
Produce of the mines and founderies, iron, copper, and metal goods	21,127,700	18,645,700
Porcelain, earthenware, mirrors, and glass	1,230,600	985,600
Dried fish, caviare, train oil, and isinglass	2,756,952	2,471,952
Corn and flour	3,428,965	2,776,965
Russian wines } Brandy, mead, &c. }	1,903,389	1,629,389
Refined sugars from St. Petersburg and Archangel	3,532,500	} 10,095,912
Miscellaneous goods,—such as potashes, soap, tobacco, paper, feathers, hogs' bristles, horses' tails, &c.	7,420,412	}
Total of Russian goods	104,094,578	86,185,778

Articles imported from Western Europe in 1837:—

	Exposed to Sale. lbs English	Rubles	Sold. Rubles.
Coffee	273,600	554,625	} 8,957,927
Indigo	263,600	2,278,500	}
Cochineal	..	819,000	}
Other drugs & foreign wines	..	7,070,802	}
Woollen manufactures	..	1,387,500	1,098,500
Cotton manufactures	..	2,433,400	1,981,700
Silks	..	2,106,700	1,491,400
Manufactures of hemp & flax	..	240,400	199,900
Total foreign merchandise		16,890,927	13,729,427

	Rubles.
Of Asiatic produce the most important article is tea, imported from China by way of Kiachta: 37,000 chests (5700 more than in 1836) of different qualities offered for sale this year were valued at	17,399,500
To which must be added 5000 chests of tea pressed into tablets	560,000
Other Chinese goods, such as silks, cottons, &c., the value of which decreases every year, while the exportation of Russian manufacture to China increases in the same proportion	32,500
Merchandise of Bokhara:—cotton, 200,000 lbs., spun cotton, 1,440,000 lbs., cotton manufacture, called bakhta, 115,000 pieces, furs, &c.	4,884,800
Goods brought by the Armenians, Persians, Georgians, &c., viz. raw silk, 40,680 lbs., cottons, furs	2,786,376
Total of Asiatic goods offered for sale, and all sold	25,652,676
Total value of all the goods exposed for sale	146,638,181
Total value of goods sold	125,567,881

Besides horses and cattle sold during the fair, about 700,000 rubles.

The fair of 1838 was still more advantageous, especially with respect to the sale of several descriptions of Russian goods.

	Exposed for Sale. Rubles.	Value of Goods sold. Rubles.
Russian goods	115,682,500	92,600,530
Western Europe and Colonial	17,310,000	13,434,950
Asiatic	23,200,000	23,200,000
Total	156,192,500	129,235,480

To the above must be added the receipts of the innkeepers and restaurateurs, both Russian and Tartar, 750,000 rubles; the theatre, 50,000; public baths, 25,000; horses and cattle sold during the fair, 870,000; and many other articles of less importance. The number of shops and booths let was 4533½, and the rent 471,178 rubles.

The number of strangers attending this fair is estimated at no less than 300,000. (Extracted from the following Russian journals:—*Journal of the Department of the Interior; Journal of Manufactures; Commercial Gazette.*)

The other principal towns in this government are—Arsamas, 8500 inhabitants, with manufactures of silk, leather, silver, iron, and soap, and considerable trade in linen, sailcloth, and shoes; Podschinski, 6500 inhabitants, with an im-

perial stud; Pawleno-Selo on the Oka, 6600 inhabitants; Liskowa on the Wolga, 4300 inhabitants; Muraschkina, 7000 inhabitants; and several other thriving towns.

(Hassel, *Handbuch*, vol. xi.; Stein's *Handbuch*, by Hörschelmann, vol. i.; Cannabich's *Lehrbuch*, Schubert, *Handbuch*.)

NISHAPOUR. [PERSIA.]

NISI PRIUS. This phrase in English law is derived from an antient writ continued in practice to the present day, in which the words occur. Previously to the time of Edward I., trials by assizes or juries could only take place in the curia regis wherever the king happened to be resident, or before the justices in eyre on their septennial circuits through the several counties of England. But by the stat. 13 Edw. I., cap. 30 (forming a part of that series of laws commonly called the Statute of Westminster 2), the judges were directed to take certain assizes, and also to try certain inquests, by juries in every county not oftener than three times in every year; but the statute required that the day and place in the county in which an issue was to be tried by the judges should be mentioned in the judicial writ which assembled the jury. Instead therefore of the old form of the Venire facias, or writ for summoning the jury, which commanded the sheriff to bring them to Westminster to try the particular cause in which issue had been joined, the writ contained a clause of Nisi Prius, thus:—'We command you that you cause to come before our justices at Westminster on the morrow of All Souls, twelve lawful men, who, &c., *unless before* (nisi prius) that day, A.B. and C.D., our justices assigned for that purpose, shall come to your county to take the assizes there.' It is always so arranged therefore that the day for the return of the jury at Westminster shall be more distant than the day for taking the assizes in the county according to the statute; and consequently the reservation or exception in the writ invariably takes effect by the justices of assize coming into the county and trying the cause before the sheriff can obey the writ by returning the jury to Westminster. [ASSIZE.] From this clause in the writ prescribed by the Statute of Westminster 2, the phrase Nisi Prius came to be adopted as a general term descriptive of the large class of judicial business which is transacted before judges of the superior courts at the several assizes throughout the country. Thus the judges of assize are called judges of Nisi Prius; when sitting alone to try causes, they are said to be sitting at Nisi Prius; and the law relating to the various matters which arise before them is, somewhat indefinitely, called the Law of Nisi Prius. It is commonly but erroneously stated in our text-books that the judges on their circuits act under a commission of Nisi Prius. This is a common error, derived however from high authority, as it is so stated by Bacon in his 'Essay on the use of the Law;' but in truth there is no such commission known to our law, the authority of the justices of Nisi Prius being incidentally annexed to the commissions of assize in the manner above stated. In Middlesex the judges are empowered to sit at Nisi Prius by the statute 18 Eliz., c. 12; and the practice is regulated by several subsequent statutes. In London they sit at Nisi Prius by virtue of immemorial usage, probably continued with occasional variations from very early times, when the king or his chief justiciary distributed justice in the immediate neighbourhood of the royal residence.

NI'SIBIS. [MESOPOTAMIA.]

NISMES. [NÎMES.]

NITH, NITHSDALE. [DUMFRIESSHIRE.]

NITHARD, born A.D. 790, was son of Angilbertus, and of Bertha, daughter of Charlemagne. He lived at the court of Charles the Bald, grandson of that prince, fought in his service, and died of wounds received in it, about 759. Nithard wrote in Latin a history of the wars between Charles the Bald and his brothers, which is inserted in Duchesne's collection 'Historiæ Francorum Scriptores.' In his history Nithard gives the text of the treaty between Charles the Bald and his brother Louis the Germanic, which was sworn to by them at Strasburg, and is dated on the 16th kalends of March, A.D. 842. This treaty was written both in the Latin and Romance languages, and is the oldest existing monument of the latter. It has been often quoted as an interesting document for the history of the modern languages which were formed in Western and Southern Europe after the fall of the Roman empire: the Romance text begins thus:—'Pro Deo amur, et pro Christian poplo et nostro commun salvament, disi di avant, in quant Deus savir et podir me dunat, si salvarai, io cist meon fradre Karlo, &c.'

NITRATES. [NITRIC ACID.]

NITRE (Saltpetre). [POTASSIUM.]

NITRIC ACID, a substance of great importance and utility in scientific chemistry and in most chemical arts. It was formerly called spirit of nitre, or Glauber's spirit of nitre; and when much diluted with water, it is called aquafortis. This acid exists largely in nature, and principally in combination with potash and with soda, forming nitrate of potash, or nitre, which exists in the East Indies, and nitrate of soda, which is found in South America: from these countries immense quantities of these salts are imported for numerous uses.

Nitric acid is composed of oxygen and azote, in proportions presently to be stated; but it is here to be observed that it never is met with except in combination with a base, nor can it be artificially obtained except in combination with water or a base constituting a salt called a *nitrate*. Dr. Priestley first showed that when the electric spark was passed through confined portions of atmospheric air, an acid was generated, and that it was the nitric acid which was so produced was proved by Mr. Cavendish.

The method by which nitric acid is obtained is that of heating, either in an iron, earthern, or glass retort, a mixture of sulphuric acid and nitre, or nitrate of potash; owing to the greater affinity existing between the sulphuric acid and potash than between the nitric acid and potash, sulphate of potash is formed, which remains in the retort, while the nitric acid separated from the potash is vaporised, and condensed in the receiver with the water of the sulphuric acid.

For manufacturing purposes, in which extreme purity is not so important, iron stills are generally used, and about an equivalent of acid and nitre are employed, with some water. But when pure acid is required, glass retorts are used, and two equivalents of acid are used to one equivalent of nitre; by this operation bisulphate of potash is obtained, which remains in the retort, whilst sesqui-hydrated nitric acid, which is the strongest procurable, is condensed in the receiver.

The properties of nitric acid are, that when pure it is a colourless liquid, but is usually yellowish, owing to a small unimportant admixture of nitrous acid, which does not anywise affect the use of it, and may be expelled by heat. Its smell is very strong and disagreeable, and it emits white fumes. It is so acrid that it cannot be safely tasted without being much diluted, and is even then very sour. In its concentrated state it stains the skin of a yellow colour, and eventually it is destroyed and peels off.

It acts strongly upon most metals; few of them however are dissolved or acted upon by it, unless it is diluted with water, and then in general nitric oxide gas is evolved, which, on coming into the air, absorbs oxygen and becomes nitrous acid vapour; hence the red colour observed when metals are dissolved in this acid.

The density of the strongest acid is 1·5; when mixed with water it gives out considerable heat; it acts strongly on vegetable blue colours, and decomposes alkaline and metallic carbonates with effervescence if previously diluted. When colourless nitric acid is exposed to the action of the light, it undergoes partial decomposition; and owing to the formation of nitrous acid, it is rendered either pale or deep orange, according to the length of time it is exposed to the sun's rays.

Nitric acid, as it exists in nitrate of potash and other anhydrous nitrates, is composed of—

Five equivalents of oxygen	40
One equivalent of azote	14
Equivalent	54

But no gaseous nor any liquid or solid compound of these proportions of these elements is obtainable; and the strongest liquid acid which has hitherto been procured, and which has a specific gravity of about 1·5, consists of—

One and a half equivalent of water	13·5
One equivalent of nitric acid	54·
Equivalent	67·5

It has already been observed that nitric acid is used for numerous purposes; such as the refining of gold and silver, in preparing various metallic and saline solutions for medicinal purposes, and the use of the dyes and calico-printer

in scientific chemical researches it is most extensively employed; its saline compounds are termed nitrates. For an account of these we refer to the particular alkalis, earths, and metallic oxides, under their several heads.

NITRIC ACID,—*Medical Properties of.* This acid in a concentrated form acts as a violent corrosive poison, and is therefore never used in an undiluted state for internal administration, but it is sometimes applied externally, when the object is to effect the speedy destruction of any part. Nitric acid however, from its frequent employment in the arts, is often the cause of accidental, rarely of intentional, poisoning, and it surpasses all the other mineral acids in the rapidity of its action, and in the consequent necessity for prompt and judicious treatment. It may be determined to have been the poisoning agent by its causing the parts which it has touched to be at first white, but soon after of a yellowish colour, which cannot be removed, like the stain of iodine, by adding caustic potass, but on the contrary becomes orange on the addition of an alkali or soap. (Pereira.) When it has been taken internally, the lining membrane of the mouth also peels off in a state resembling parchment. The most appropriate antidotes are such substances as combine with and neutralize the acid: chalk or magnesia, made into a paste with water—or, if these are not at hand, the plaster of the apartment, bruised down and drank—will answer best. 'While these are preparing, the acid should be diluted by the free use of any mild fluid, milk or oleaginous matter being preferred. The carbonates of the alkalis are by no means eligible antidotes, as the resulting compounds themselves possess corrosive properties.' (Christison.) A solution of soap may be administered, though some object to it from the presence of the alkali in it, but apparently without sufficient ground. If recovery should take place, the individual long suffers from indigestion, and is almost always constipated.

In an undiluted form, nitric acid is a most valuable application to sloughing phagedenic ulcers; also for destroying warts, or causing vesication over the stomach in Asiatic cholera, or for dropping into a carious tooth to relieve toothache. For all other purposes it is very largely diluted.

In its action on the system it differs from other acids, inasmuch as it does not produce the cooling and thirst-allaying effect which they do, but on the contrary causes a feeling of warmth in the stomach, with thirst and increase of appetite. The use of it continued for some time gives rise to general effects; an excitement is felt through the whole system; the pulse becomes quick, the exhalation great; and an increased secretion from the salivary glands, mucous membranes, the liver, and kidneys is manifest. Perseverance in the use of this agent however at last produces many bad consequences; and in persons much disposed to bleeding from the lungs, it almost invariably causes such bleeding to occur, as well as heat in the chest and obstinate cough. Very largely diluted, it furnishes one of the best drinks in fevers accompanied with great prostration of strength.

It is also a very excellent tonic in many cases, and seems to form the best substitute for the bile where that secretion is scanty. That it greatly augments the secretion of bile, the nature of the evacuations abundantly proves. Hence it differs from almost all other tonics in not causing constipation, but rather the contrary. In calculous diseases of the phosphatic diathesis it has been used with great benefit; and also, very largely diluted, it has been injected into the bladder as a direct solvent. [LITHONTHRYPTICS.] In the treatment of scrofula it is a most valuable remedy, but its use must be every now and then suspended, owing to the effects which it produces on the stomach.

It has been regarded as a substitute for mercury in some cases, especially as it promotes the secretion of saliva. It ought never to be given at the same time as mercury, nor even soon after a dose of any mercurial preparation, since a poisonous nitrate of mercury may be formed in the stomach. Lastly, nitric acid increases the efficacy of many other medicines, such as ammoniacum, cusparia, and opium.

Nitric acid in the form of vapour was formerly employed as a disinfecting agent, but it is now almost disused. The vapour must be carefully avoided, as the inhalation is very deleterious.

Nitric acid in combination with hydrochloric acid, added to a large quantity of water, has been used as a bath in chronic diseases of the liver, particularly in India, but it does not seem entitled to much credit.

NITRIC OXIDE, the *nitrous air* of Priestley, since also termed *deutoxide of azote, deutoxide* or *binoxide of nitrogen*, &c. Although this gaseous body had been obtained by Hales, yet it is to Dr. Priestley that we owe the first distinct account of the method of procuring it and a description of its properties.

It has been already mentioned that when certain metals are put into dilute nitric acid, they are dissolved. During their solution, owing to the partial decomposition of a portion of the nitric acid and the absorption of its oxygen by the metal, a gaseous body is plentifully formed and evolved, which has the following properties:—it is gaseous, or permanently elastic, not having been hitherto condensed into a liquid by any degree of cold or pressure to which it has been subjected. It is colourless, and probably tasteless and inodorous; but when an attempt is made to inhale it, it excites violent spasm of the glottis by meeting and combining with the oxygen of the air, which converts it into nitrous acid gas, a very different compound. Its specific gravity is about 1·040; 100 cubic inches weighing rather more than 32 grains. Water at 60° dissolves about 11 per cent. It has no action on litmus paper, nor does it in any way exhibit the properties of an acid; but as already noticed, nitrous acid is formed as soon as it comes into contact with oxygen, and then it reddens litmus paper; this property distinguishes it from all other gases whatever, and renders it a test of the presence of uncombined oxygen: this is the gas first employed by Dr. Priestley in his admirable eudiometrical researches. It supports combustion in some cases; thus charcoal and phosphorus immersed into it when they are in vivid combustion, burn splendidly in it, but a candle and burning sulphur are extinguished. It is probably decomposed when passed through red-hot tubes; and the same effect is produced by a succession of electric sparks. It is also decomposed when exposed to zinc or iron, which take away half the oxygen and convert it into *nitrous oxide*. It is soluble in a solution of protosulphate of iron; the solution has a deep green or brownish colour, and has been used in eudiometry to ascertain the proportion of oxygen in gaseous mixtures; but it is questionable whether it can be advantageously so employed.

It is composed of—

Two equivalents of oxygen .	16
One equivalent of azote .	14
Equivalent .	30

or, by volume, of—

Fifty cubic inches of oxygen gas =	17·20 grains
Fifty cubic inches of azotic gas =	15·05 „
	32·25 grains.

As then 100 cubic inches weigh 32·25 grains, its specific gravity must be 1·040.

NITRITE. [NITROUS ACID.]

NITROBENZIDE. When benzin is added in small quantities at a time to concentrated hot nitric acid, action takes place, and the resulting compound remains dissolved while the liquid retains its heat, but on cooling a portion of it separates and floats on its surface; this substance, when removed, distilled, and washed with water, is nitrobenzide, and possesses the following properties:—

It is liquid, has a light yellow colour, a very sweet taste, and a peculiar odour, intermediate between that of oil of cinnamon and of bitter almonds. Its specific gravity is about 1·209; it boils at 415°, and condenses without having suffered any alteration; it becomes solid and assumes the form of acicular crystals at about 38°. When heated in concentrated sulphuric acid, both are decomposed, and sulphurous acid is evolved. In a liquid state neither chlorine nor bromine has any action upon it; but when chlorine is passed with it through a red-hot tube, hydrochloric acid is formed. When heated with potassium, it detonates; but potash in solution has little action upon it. Ammonia does not produce any change in it. The specific gravity of its vapour was found by Mitscherlich, who discovered this compound, to be from 4·40 to 4·35; and, according to him, it is composed of—

Hydrogen . . .	4·06
Carbon . . .	58·54
Oxygen . .	26·02
Azote . . .	11·38
	100·

NITROGEN. [AZOTE.]

NITROHEMATIC ACID. This acid was discovered by Wohler. Its name is derived from *hæma* (αἷμα), *blood*, in allusion to the colour of its salts. It is prepared by mixing carbazotic or nitropicric acid with protosulphate of iron and digesting the mixture with hydrate of barytes and water. The protoxide of iron, separated, becomes peroxide at the expense of the nitropicric acid, and a new acid is formed, which is the nitrohematic acid; it is separated by a tedious process from the barytes with which it combines as it is formed, and then has the following properties :—

It has the form of small brown crystalline grains, and scarcely any taste; when exposed to a moderate heat, it begins to liquefy and afterwards detonates without the evolution of light, but with the formation of cyanide of ammonia and the deposition of carbon, which burns without leaving any residue. It is but slightly soluble in water, and the solution is yellow; it dissolves in nitric acid.

With bases it forms peculiar salts, the solutions of which are of a deep blood red colour; but when dry, they are of a deep brown with a tint of green and a semimetallic lustre; the alkaline and earthy salts of this acid have a bitter taste, and when heated they detonate like gunpowder. The nitrohematate of ammonia has rather a crystalline appearance, and when heated it detonates with the evolution of light, and the formation of much cyanide of ammonia. This acid does not appear to have been analyzed.

NITROLEUCIC ACID, a compound prepared by Braconnot, by heating leucin [LEUCIN] with nitric acid. To obtain it, the leucin is to be dissolved in nitric acid with the aid of a gentle heat: slight effervescence occurs during the operation, but without the formation of red vapour. By evaporation the liquid becomes a mass of white slender crystals, which are to be pressed between pieces of filtering paper in order to get rid of the excess of nitric acid, and they are then purified by solution in water and recrystallization.

This acid has a sour taste, but not strongly so. With bases it forms peculiar salts, of which only two have been described, namely the nitroleucate of lime and of magnesia; these are both crystallizable, and, unlike the nitrates of these bases, they do not deliquesce when exposed to the air, and they detonate when heated. Nitroleucic acid has not been analyzed.

NITROMURIATIC ACID. [CHLORINE.]

NITRONAPHTHALASE, a substance formed by M. Laurent in 1835. It may be prepared by boiling naphthalin in nitric acid; this suffers decomposition, and an oily substance collects on the surface of the liquid, which afterwards becomes solid and crystalline; from this the nitronaphthalase is separated by solution in boiling alcohol and crystallization; it has the form of a square prism terminated by acute pyramids; its colour is sulphur yellow; it melts at about 110°. It may be sublimed without decomposition, and the vapour, on condensing, crystallizes. It is neutral, and insoluble in water, but alcohol and æther readily dissolve it. By chlorine it is decomposed, and chloronaphthalase is formed; bromine has a similar action, but it is not affected by iodine. Hydrochloric acid has no effect upon it; in sulphuric acid it dissolves, and is precipitated from it by water unchanged; nitric acid converts it into nitronaphthalase. A solution of potash in water, even when boiling, produces little effect upon it, but it becomes red in an alcoholic solution of potash, which concentrated sulphuric acid changes to green or bluish green.

According to M. Laurent, nitronaphthalase consists of

Seven equivalents of hydrogen . .	7
Twenty equivalents of carbon . .	120
Four equivalents of oxygen . .	32
One equivalent of azote . . .	14
Equivalent . . .	173

It appears that during the action of the nitric acid on the naphthalin the acid loses one equivalent of oxygen and the naphthalin one equivalent of hydrogen, which form water, and the remaining elements of these compounds constitute nitronaphthalase.

NITRONAPHTHALESE was, like the preceding, described by M. Laurent. It is prepared by boiling nitronaphthalase for a long time in nitric acid; it has the form of minute acicular crystals. It is insoluble in water, slightly soluble in æther, but readily so in alcohol; it becomes liquid at 365°. Hydrochloric or nitric acid has no effect upon it, but hot concentrated sulphuric acid dissolves it, and on cooling the nitronaphthalese crystallizes, and the solution is also decomposed by water. It is but slightly acted upon by a solution of potash even when heated; a little ammonia is however evolved.

By analysis it yielded

Six equivalents of hydrogen . .	6
Twenty equivalents of carbon . .	120
Eight equivalents of oxygen . .	64
Two equivalents of azote . . .	28
Equivalent . . .	218

In the formation of nitronaphthalese by the action of nitric acid upon nitronaphthalase, it appears that the oxygen of the nitric acid removes an equivalent of hydrogen from it, and yields it one equivalent of azote.

NITROPICRIC ACID. [CARBAZOTIC ACID.]

NITROSACCHARIC ACID. When glue is treated with sulphuric acid, a peculiar saccharine matter is formed, which is called sugar of gelatin; and when this is heated with nitric acid, no effervescence occurs, but combination is effected between the acid and the sugar, and the compound crystallizes on cooling. When the excess of nitric acid has been separated by draining, and the nitrosaccharic acid purified by solution in and crystallization from water, it has the following properties:—it has the form of rather flat prisms, which are colourless, transparent, and striated. It has a sour taste, and a sweetish one also. It is very soluble in water, but insoluble in alcohol, even when boiling. When it is heated it swells, decomposes, and yields a penetrating vapour. It forms peculiar salts, which detonate vividly when they are heated. Nitrosaccharate of potash, whether the acid is in excess or otherwise, crystallizes in needles, which are totally different from those of nitrate of potash, though its taste is somewhat similar, but accompanied with a little sweetness. Nitrosaccharate of lime yields fine acicular crystals, which do not absorb moisture from the air, are slightly soluble in alcohol, fuse when heated in their water of crystallization, and afterwards detonate. Nitrosaccharate of magnesia is deliquescent. Zinc and iron dissolve in this acid with the evolution of hydrogen gas, and deliquescent salts are formed. Nitrosaccharate of copper crystallizes and does not alter by exposure to the air; with oxide of lead a salt is formed, which dries into a mass resembling gum; it does not become moist in the air, and decomposes with explosion when heated. Nitrosaccharic acid has not been analyzed.

NITROSULPHURIC ACID. This name has been applied to a mixture of nitric and sulphuric acid first proposed by Mr. Keir as a solvent for silver. He found that when one part of nitre was added to about ten parts of sulphuric acid, a mixture was formed which dissolves silver at a temperature below 200°, while it scarcely acts upon copper, lead, or iron, until diluted with water; and the solution of silver which is formed may be moderately diluted before any sulphate of silver separates. On account of these properties this mixed acid has been found useful in separating silver from old plated articles; the silver may be precipitated from solution either in the state of chloride by the addition of common salt, or, after the silver has been dissolved, the copper from which the silver has been separated will precipitate it in the metallic state, when water is added to the solution.

In 1835 M. Pelouze discovered an acid compound of sulphur, oxygen, and azote, to which he gave the name of nitrosulphuric acid, but he was not able to obtain it in a separate state. It formed however salts with ammonia, potash, and soda. Its properties have not been very minutely examined, but it was found to consist of

One equivalent of sulphur . .	16
Six equivalents of oxygen . .	48
Two equivalents of azote . .	28
Equivalent . . .	92

NITROUS ACID, a compound consisting of the same elements as nitric acid, but combined in different proportions. It consists of, or rather is equivalent to, nitric acid deprived of one-fifth of its oxygen. It may be prepared either in a gaseous or fluid form, in which it differs from nitric acid, for the latter requires either water or a base to hold its elements in combination.

Gaseous nitrous acid is formed by mixing in an exhausted

vessel two volumes of nitric oxide and one volume of oxygen gas; immediate combination and condensation occur; heat is evolved; a red gas is formed, which is the nitrous acid; and when this coloured gas is subjected to a temperature of 0°, it becomes liquid. When also nitrate of lead is heated in a retort, it is decomposed, and a red vapour is emitted, which is condensed by being subjected to a freezing mixture.

The properties of liquid nitrous acid are, that when cool its colour is pale, but it becomes darker when heated; it emits a very strong disagreeable odour, and at a very moderate rise of temperature it reassumes the gaseous form. Its specific gravity is 1·451. It is decomposed by water with strong effervescence, and it is immediately separated into nitric oxide, which is evolved (and on coming into the atmosphere, absorbs oxygen and again forms nitrous acid gas), and nitric acid, which remains in solution. It is on account of its easy decomposition that it does not combine with bases to form salts.

Nitrous acid gas is composed of one volume of azotic gas and two volumes of oxygen gas condensed into one volume. Its specific gravity is to that of air about as 3·19 to 1, and 100 cubic inches weigh nearly 99 grains. By weight it is constituted of

Four equivalents of oxygen . .	32
One equivalent of azote . .	14
Equivalent . . .	46

NITROUS GAS. [NITRIC OXIDE.]

NITROUS OXIDE GAS. This compound was first obtained by Dr. Priestley, who called it dephlogisticated nitrous air: he procured it by exposing nitric oxide gas to the action of iron, which deprived it of a portion of its oxygen, and reduced it to the state of nitrous oxide, sometimes called protoxide of nitrogen or gaseous oxide of azote. The properties of this gas were minutely examined by Davy at an early period of his brilliant career. The best method of procuring it is to subject nitrate of ammonia to moderate heat in a retort; both the nitric acid and ammonia are decomposed, and their elementary oxygen, hydrogen, and azote re-combine in such proportions as to form water and nitrous oxide gas.

The properties of this gas are, that it is colourless and transparent, its smell is peculiar but rather agreeable, and its taste is sweet: 100 cubic inches weigh about 47 grains, and its specific gravity is to that of air therefore about as 1·5 to 1. Water absorbs about an equal bulk of this gas, which, on being heated, it gives back unchanged. It has no action upon uncombined oxygen, in which it differs remarkably from nitric oxide. Nitrous oxide gas is composed of one volume of oxygen and two volumes of azote condensed by combination into two volumes, or by weight it consists of

One equivalent of oxygen . .	8
One equivalent of azote . .	14
Equivalent . .	22

Nitrous oxide supports combustion, and a taper, ignited phosphorus, sulphur, and charcoal burn vividly in it; at a red heat it is resolved into its constituent gases in the proportions stated. When a mixture of one volume of this gas and one of hydrogen is fired by the electric spark, water is produced, and one volume of azote remains: this shows that it must contain half a volume of oxygen, it being required to form water with the one volume of hydrogen.

This gas was supposed to be irrespirable, until the contrary was proved by Davy, in his 'Researches on Nitrous Oxide.' To that work we must refer for an account of the very exhilarating effects which this gas produces when respired.

NIVELLES, a town of South Brabant, in 50° 35′ N. lat. and 4° 18′ E. long., on the little river Thienne. It contains manufactories of fine linens, lace, and woollen stuffs; oil-mills and a paper-mill. The population in 1836 was 7814. Nivelles is the chief place of a district, with 127,881 inhabitants. It is distant 19 miles south from Brussels.

NIVERNOIS, or NIVERNAIS, LE, one of the provinces into which France was divided before the Revolution. It was bounded on the north by Orléanois and the district of Auxerrois in Bourgogne; on the east by Bourgogne; on the south by Bourbonnois; and on the west by Berry or Berri. It comprehended a number of subordinate districts, as follow:—

Districts.	Chief towns.
Les Vaux, or Les Vallées de Nevers	Nevers.
Le Donziois . .	Donzi.
Les Vallées d'Yonne . .	Clamécy.
Les Vallées de Montenoison .	Montenoison.
Les Vallées des Amognes	Montigny-aux-Amognes.
Le Pays d'entre Loire et Allier	St. Pierre le Moûtier.
Le Bazois . . .	Moulins en Gilbert.
Le Morvant . .	Château Chinon.

It is almost entirely comprehended in the modern department of Nièvre, to which we refer for an account of the natural features and present condition of the district. We shall here only notice its feudal history. It constituted the county of Nevers. This county does not appear to have been constituted until the ninth or tenth century, when it was a dependency of the duchy of Bourgogne, to which it was at intervals during that century reunited. The regular succession of its counts begins with Otton Guillaume (A.D. 987). Laudri, son-in-law and successor of Otton Guillaume, acquired the county of Auxerre (A.D. 1015), and Guillaume II. acquired also that of Tonnerre: he was contemporary with King Louis VI. *le Gros*, to whom, in his contests with his vassals, he rendered considerable assistance. Guillaume III., son of Guillaume II., followed Louis VII. of France (*Le Jeune*) to the second crusade (A.D. 1147); and Agnes, countess of Nevers, was the wife of Pierre de Courtenay, the unfortunate emperor of Constantinople (A.D. 1216). The counties of Nevers, Auxerre, and Tonnerre were afterwards (A.D. 1266) separated, and descended to different branches of the family. That of Nevers was for a time held conjointly with the counties of Flanders and Rethel by Louis II., who fell in the battle of Creci (A.D. 1346). It was subsequently possessed by branches of the ducal families of Bourgogne and Clèves, and was raised to the rank of a duchy in favour of François I. of Cleves by the king François I. of France (A.D. 1539).

This François, duke of Nevers, was one of the most distinguished French captains of his day, and signalised his valour and skill in the wars of Henri II. against the emperor Charles V. and Philippe II. of Spain. By the marriage of his grand-daughter the duchy came to Louis de Gonzague or Gonzaga, son of the duke of Mantua, who bore a distinguished part in the religious contests of France in the sixteenth century, and it remained in the Gonzague family until sold to Cardinal Mazarin, a few years after which it was united to the French crown.

NIZAM, the title of the sovereign of Hyderabad, derived from Nizam-ul-Mulk, who, after the death of Aurungzebe, obtained possession of the Mohammedan conquests in the Deccan, his name being assumed as a title by his successors in the sovereignty. After reigning 31 years, Nizam-ul-Mulk died at a very advanced age, in 1748. He was succeeded by his second son Nassir Jung, who was assassinated in 1750. His grandson Muzuffer Jung was then placed on the throne, and also assassinated in the year following. The third son of Nizam-ul-Mulk, Salabut Jung, then reigned until 1763, when he was put to death by his brother Nizam Ali, who thereupon took the reins of government, and held them till his death in 1803. His successor Sekundar Jah died in 1829, and was succeeded by the reigning Nizam.

The province of Hyderabad lies between the 15th and 22nd degrees of N. lat., and between the 75th and 82nd degrees of E. long. It is bounded on the north by Kandeish and the ceded districts on the Nerbudda; on the east by the rajah of Berar's dominions and the Northern Circars; on the south by Guntoor and districts ceded by the rajah of Mysore; and on the east by the Southern Mahratta Country, Bejapore, and Aurungabad. The extreme length of the province from north to south is 420 miles, and its extreme breadth 360 miles: its area is about 95,000 square miles. The surface is hilly, but not mountainous, and consists of elevated table-land: the climate is in consequence more temperate than the lower lands in the same latitude. There are numerous streams during the rainy season, but at other times they are dry, and at no time are any of them navigable. But little is known of the physical features of the country or of its productions.

The Nizam is one of the native sovereigns with whom the East India Company has subsidiary treaties. The chief provisions contained in these treaties are: 1st, protection by

the British government against all enemies, foreign or domestic; 2nd, mutual co-operation in the event of hostilities with other powers; 3rd, the maintaining of a British force for the protection of the native state; 4th, the reception of a British resident, by whose counsel the native government is bound to abide as regards all public affairs, internal or external; and 5th, the abandonment on the part of the native prince of all political intercourse with other powers, except through the medium of the British government. Under this system the native princes are little more than viceroys, who administer the government according to the views of their superior; and in fact the British residents appointed under subsidiary treaties are not so much ambassadors as they are ministers. The first treaty made by the British with the Nizam was in 1766, by which we engaged to afford him military aid, and in return received from him the cession of the Northern Circars; but the first subsidiary treaty, as above explained, was made with him in 1790, preparatory to the war with Tippoo Sultan. A second subsidiary treaty was made in 1798, and another (the last) was concluded in 1800. The force which the British agreed then to provide was eight battalions, of 1000 men each, of native infantry, and two regiments, of 500 each, of native cavalry; and the Nizam agreed in return to cede to the English all the territories he had acquired under the partition treaties of 1792 and 1799, that followed the wars with Tippoo. In 1803 an arrangement was made, under which the Nizam agreed to receive a regiment of 1000 European soldiers instead of 2000 natives. Sekundar Jah, who reigned from 1803 to 1829, is represented as having been weak, extravagant, and rapacious; and having been supported by the English, under their treaty, in the oppressive measures which he adopted towards his subjects, a constant change in their condition from bad to worse was experienced, the population became more scanty, and they were gradually and progressively reduced to a condition of abject misery. The consequence thus experienced has been in various cases found to result from the subsidiary connection between England and the native rulers: in the case of the Nizam, this consequence has probably been aggravated by the fact that the government is Mohammedan, while the people are Hindus.

NIZZA. [NICE.]

NOAILLES, DE, the title of an old and illustrious family of the French nobility, which originally belonged to the province of Limousin, where it had a château and hereditary domain not far from Brives. Mention is made of the lords of Noailles in old documents as far back as the beginning of the eleventh century. Moreri (*Dictionnaire Historique*) gives the genealogy of the lords of Noailles, beginning with Hugues, who lived in the first part of the thirteenth century, and who went to the Holy Land with Louis IX. and died on the journey. Many individuals of this family figure in the history of France, as filling high offices both civil and military. The most distinguished are—1. Anne Jules, duke of Noailles, peer and marshal of France, who served in the armies of Louis XIV., and died in 1708. 2. Adrien Maurice, duke of Noailles, son of the preceding. He distinguished himself in the Spanish campaigns during the war of the Succession, took the strong fortress of Gerona in Catalonia, was made grandee of Spain by Philip V., and minister under the regent D'Orléans. He afterwards commanded the French armies in Germany and Italy in 1733-5, and again in 1741-3. He died at Paris in 1766. His wife was Françoise d'Aubigné, niece of Madame de Maintenon. Millot published after his death 'Mémoires Politiques et Militaires pour servir à l'Histoire de Louis XIV. et Louis XV., composés sur les Pièces Originales recueillies par Adrien Maurice, duc de Noailles.' These memoirs contain many interesting particulars. 3. Louis Antoine, cardinal de Noailles, uncle of the preceding, was made archbishop of Paris in 1695. He became involved in the wearisome disputes between the Jansenists and the Jesuits, displeased both parties, and at last incurred the displeasure of Louis XIV. on the subject of the famous papal bull 'Unigenitus.' [CLEMENT XI.; JANSENISTS.] After the death of Louis XIV. the regent recalled Cardinal de Noailles to court and showed him great favour. The cardinal died at Paris in 1728, highly esteemed for his learning and regretted for his sincere piety and his great charitableness. He was a true ornament of the French church. 4. Louis, viscount of Noailles, was returned in 1789 to the States-General for the order of nobility by the bailliage of Némours, and, like several others of his order, cordially adopted the principles of the Revolution. On the memorable night-sitting of the 4th August, Noailles proposed and carried the suppression of feudal rights, and of all other privileges enjoyed by the nobility and clergy, and on the 19th September he moved for the suppression of all titles of nobility, which motion was also carried. After the end of the session of the National Assembly he repaired to the army on the Rhine, but when the Jacobin party obtained the ascendency he emigrated. He returned under the consulate, was sent by Bonaparte to S. Domingo as general of brigade, and was killed, in 1803, in a sea-fight against the English.

NO'BIA, Dr. Leach's name for a genus of Sessile Cirripeds resembling *Pyrgoma* of authors [CIRRIPEDA, vol. vii, p. 209], consisting of a conical paries placed upon a funnel-shaped cavity in a madrepore, but with only two opercular valves instead of four.

NOBILITY. The slightest attention to the nature and the actual experience of man must convince every one that society has a tendency to inequality in the condition of the persons composing it. Take half a dozen youths, and place them in a society apart from all other persons of their kind; place them under no other condition than that each person shall enjoy what is his own in his own way; let the whole be at first as nearly on an equality as possible in respect of advantages which are not those of mere nature; and it is certain that at the end of fifty years they and their families will be in a state of great inequality, that some one among them will have attracted to himself more of the things which make life easy than any of the rest, and that there will be not only a difference but a very great difference between the most and the least successful of the party.

This arises from the inequality of the physical, the moral, and intellectual power of each, that is, of some one of those things which we say are the gifts of nature, combined with the introduction of principles and habits at a very early period of life, the things in short which make the man himself, independently of the adventitious advantages which are derived from the possession of things external to himself.

Thus bodily strength, adroitness, quickness of eye, capacity of bearing fatigue, steady industry, frugality, temperance, caution, foresight, aptness to seize opportunities, knowledge of the dispositions and characters of other men, will in any situation of life prove advantageous to those who possess them; and those who want them and are without an equivalent in some other valuable quality, can never expect to be in a situation equally favourable, when time has been allowed for the exercise of these faculties and for the production of their natural fruits.

Again, in the divine government of the world, or, to speak more generally, in the course of events, there are favourable chances, so to speak, presented to some men; and unfortunate accidents which sometimes deprive the best-deserving and the most able of their reward, or which sink still lower the less deserving and the least able.

When once a little advantage is gained, and another generation arises starting in life with the possession of the advantages which the talent or the good fortune of the father secured for it, if the same good physical, moral, or intellectual faculties are inherited, as may be the case, it is manifest that the elevation will become higher and the distinction greater. This will go on in an accelerating ratio, for the adventitious advantages operate as in a series of compound interest. On the other hand there may be a declension in another, till the lowest possible point of destitution has been reached. It seems that if once the principle of *property* is admitted, and every man is guaranteed in the possession of that which belongs to him, what we have described must necessarily take place. Society may by its institutions do something to restrain this tendency, or something which shall in its effects promote it; but society can never preclude it, except by measures which shall annihilate *property*. Whether such measures can be desirable, it is not our present business to discuss.

It is thus, we conceive, that the distinction of *nobiles* and *vulgares*, which we find in the earliest records of human society, must have originated.

Political consideration and political power will in some degree always follow wealth; and thus it has been that a larger share of influence in the direction of the affairs of a community has always fallen to the lot of those in whose hands, by their own exertions or those of their ancestors, a

larger share of adventitious advantages had been accumulated than in the hands of others less able or less fortunate.

Nobility, in the earlier stages of civilization, consisted, it is probable, in nothing more than the union of political power with wealth; but this would soon pass into that other state in which we in Europe now see it, where the particular political advantages were guaranteed to the family of him who once possessed himself of them, by which means there was created a new and very important distinction in society, and it became necessary that society should define who the persons were that were admitted by it to such desirable privileges. It was not now the mere possession of wealth and of that political power which will always more or less attend wealth which made a man *nobilis;* there must be some recognition of his admission into what constituted an order endowed with such privileges. Being once secured as an hereditary possession, these privileges might fall to persons who had not wealth or the means of obtaining it, nor the influence and power which wealth brings with it.

When once society had thus established an order and regulated the means by which persons might be admitted into it, the desire would become general of admission to the privileges and advantages which belonged to it, in persons who had any pretension to aspire to such high advantages. It was then easily discovered that society had thus an unexpensive way opened to it of rewarding very eminent services. A community has not always manors and lands to give to the man who performs for it such services, nor are money pensions out of the taxes, continued from generation to generation, agreeable to those who contribute to the payment of them. But a society accustomed to such an order and sensible of the benefits which attend the existence of such a state of things willingly sees advanced into it men who are distinguished by very eminent talent, very eminent services, or very eminent virtues. It is a reward not given all at once, but through a long succession of years.

In the different countries of modern Europe there are nobles various in their titles and various in the privileges belonging to them. In England, Scotland, and Ireland, the heads of the families which are noble are either dukes, marquesses, earls, viscounts, or barons; all, except the last, originally names of office, originated in that state of society where the *nobiles* were all men in actual political employment. To the heads only are political privileges given, the chief of which is, that the English peers have seats in the House of Lords, and consequently a voice in all projected changes of the law. But the junior members of the family are accounted noble, and have certain titles or honourable distinctions united with their names.

By the English constitution the privilege of placing a family in the rank of the nobility is vested solely in the king. The phrase by which this is usually expressed is, that the king (or queen) is the fountain of honour. It is done by letters-patent declaring that such or such a person is created to the dignity, &c., to descend to the heirs male of his body, or in such manner as the crown may choose to direct.

The persons admitted into the order of nobility in England are now usually—1, Peers of Scotland or Ireland; 2, Persons distinguished for services in the army, navy, diplomacy, and for political services; 3, Younger branches of families already noble; 4, Persons of antient wealth, with sometimes, though rarely, persons of large fortunes which have been recently acquired; and 5, Persons promoted to high judicial appointments, as the lord chancellor, the chief justice of the King's Bench, and others, usually called the law-lords.

Of the 41 persons who were first admitted into the order of the English nobility by King William IV., previous to January 23, 1836, there were—

Irish peers	10
Scotch peers	6
Members of families already noble	7
Possessors of antient inheritances	7
Connected with the legal profession	6
For political services	4
For naval services	1

New creations are essential to keep up the order, as extinction is perpetually taking place in a nobility such as the English, where few of the titles descend in any other way than to the male descendants of the person first ennobled.

There are modern communities, such as the United States of North America, in which there is no nobility in any respect resembling that of Europe. Wealth of course gives some influence and importance to the possessor, but it is also an object of jealousy, which must always be the case, more particularly in democratic constitutions. Office, so long as it is held, gives greater distinction than wealth; but office is only held for a short time, and wealth, although it may be acquired by an individual, is seldom transmitted to a single person, but is usually distributed in moderate or small portions among several persons. Thus it has been observed, that in the United States a family seldom maintains any great wealth or importance for more than two generations. Names which have been made illustrious by an individual are remembered only because of him who first elevated them to distinction, and the descendants of the wealthy lose with their wealth the remnant of that importance which their ancestor acquired. Thus one family of distinction after another sinks into obscurity, and its place is soon filled by a name before unknown.

NOCE'RA DEI PAGA'NI, the Roman NUCE'RIA, a town on the south-eastern border of Campania, and now belonging to the province of Principato Citra. It is situated at the opening of a valley into the Campanian Plain, at the foot of that offset of the Apennines which stretches from the central ridge into the peninsula of Sorrento, and on the high road from Naples to Salerno. It is a short distance from the left bank of the river Sarno, in a very fertile country, planted with vines and Indian corn. The country is artificially irrigated from wells. The modern Nocera is an open straggling town: it is a bishop's see, has several churches and convents, a clerical seminary, fine barracks for cavalry, and about 6000 inhabitants. The walls and castle of the old town, which was forsaken on account of the earthquakes, are on the hill above. About a mile from the present town, on the road to La Cava, is a circular church, which has been mistaken by some for an antient temple, but it evidently dates from the earlier ages of Christianity. It is somewhat similar in form to that of S. Stefano Rotondo at Rome; an octagonal basin occupies the centre of the building, the pavement of which is considerably below the exterior level. A double row of marble columns disposed in a circular range support the roof upon arches. The interior is gloomy and the walls are green from the dampness. (Keppel Craven, *Tour through the Southern Provinces of Naples.*)

Nuceria was destroyed by Hannibal (Livy, xxiii. 15), after whose departure for Lucania the dispersed inhabitants were settled by the Romans in Atella, the inhabitants the latter town having been transferred to Calatia (xxviii. 3). The town of Nuceria was however rebuilt and became a Roman colony. After several vicissitudes, it was partly destroyed by earthquakes in the time of the early Norman kings, in the eleventh century, when the inhabitants resorted to the present site. The adjunct 'Dei Pagani' which it bears has been variously accounted for; some derive it from the Saracens, called Pagans in the middle ages, who occupied the town for a considerable time in the tenth century; others from a powerful baronial family, Pagani by name, one of whom, Hugh de Payen, was grand-master of the Templars in the time of the emperor Frederic I. (Lunadoro, *Lettera intorno all' Origine di Nocera,* 4to., Naples, 1610.)

NOCE'RA, NUCERIA, a town of antient Umbria, now belonging to that province of the Papal State called 'Delegazione di Perugia.' It is built on a steep hill on the western side of the central ridge of the Apennines, near the source of the river Topino, the Tenia of the antients, which is an affluent of the Tiber. Nocera lies on the high road from Rome to Pesaro and Rimini, which, after passing by Iguvium, the modern Gubbio, crosses the Apennines near the sources of the Metaurum, following the track of the old Flaminian Way. Nuceria was a city of the Umbri, and is mentioned by Livy (ix. 38) as having surrendered to the Romans, with other towns of Umbria, in 307 B.C. It was afterwards a municipium, like Bevania, Ameria, and other cities of Umbria, but in the wars of the Triumvirate, having taken part against Octavianus, he sent a military colony there. In the fall of the Western empire, Nuceria was repeatedly devastated by the Visigoths and other northern tribes, being on the high road to Rome. Under the Longobards it formed part of the duchy of

Spoleto. In the year 1198 Innocent III. annexed it to the Papal territories. It is now greatly decayed from its former importance, but it is still a bishop's see and has 2600 inhabitants. The surrounding territory, which is hilly, produces wine, oil, and plenty of fruit. In the neighbourhood of Nocera is a mineral spring, which has been found useful in several complaints.

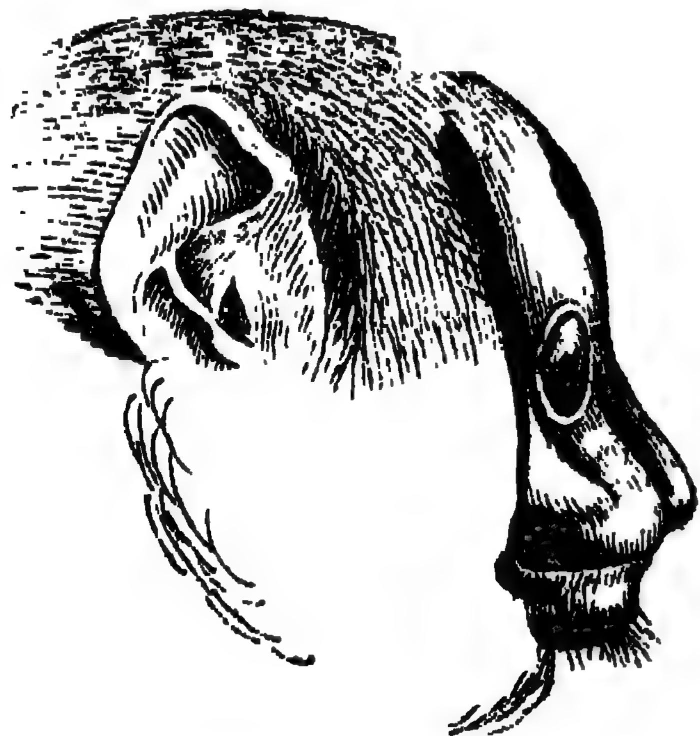
(Jacobilli, *Cronica di Nocera*; Neigebaur; Morichini, *Saggio medico-chimico sopra l' Acqua di Nocera*, Fuligno, 1808.)

NOCHISTLAN. [MEXICAN STATES.]

NO'CTHORA, M. F. Cuvier's name for the *Douroucouli*, a quadrumanous animal of the New World, with several characters that remind the observer of some of the *Lemuridæ* (the Loris especially) of the antient continent and its islands. Indeed Dr. Horsfield and Mr. Vigors observe (*Zool. Journ.*, vol. v.) that to the philosophic inquirer 'it will equally be a *Lemur* among the *Monkeys* or a *Monkey* among the *Lemurs*.'

Humboldt, who first gave a detailed and clear account of this curious form, sees in it, and with good reason, an approximation to the *Slow Lemur* or *Lori paresseux* of the French (*Lemur tardigradus* of the south of Asia), and the physiognomy and features, particularly the eyes, well justify the comparison. So far it would seem to represent in America the *Lemuridæ* of the Old World; but the teeth are the same with those of the *Sajous* (*Simiæ apella*, *capucina*, &c., Linn.), according to M. F. Cuvier, who observes, that if the canines were small and little in the individual examined by him, it was because that individual was a female. The diameter of the small intestines was extremely small, and the cæcum simple and only about two inches deep, and sensibly smaller than the stomach.

The organs of motion do not present anything very particular: the four extremities or hands are formed exactly like those of the *Sajous*, except that the animal does not extend the fingers of the fore-hands, which remain raised as M. F. Cuvier has represented them (see the cuts). The nails are long, narrow, channelled (en gouttières), and a little hooked: the tail is very moveable, but not prehensile, though the animal can turn it over its back, or round its neck or its legs. The pupil of the eye is round, and the eyes themselves are very large and without any accessory organ.



Profile of the Douroucouli.



Fore-hands of the Douroucouli.

The external ear is much developed and very like that of the *Simiæ* generally. The aperture of the nostrils is not wide. The mouth is very large and without cheek-pouches. The fur is soft, thick, and of a silky nature. The interior of the hands presents areæ formed of very fine striæ, always parallel and ordinarily circumscribed the one within the other. Vulva grandis externè vulvæ canum simillima. Under each axilla a teat.

Colour.—Fur above grey, formed of hairs whose base is black, and which, in the rest of their extent, are annulated with white and black; below, orange from the chin to the vent, the same colour extending upon the sides of the neck. Tail yellowish-grey for three parts of its length, and the rest black. Above the eyes white: three black lines divide the forehead; one springs from between the eyes, the two others arise at the external angle of those organs, and as they ascend are curved towards the first. The inside of the hands and ears is naked and flesh-coloured. The face, naked also, is of a sooty black. The iris is yellowish-brown, and the nails black.

Such are the leading points of M. F. Cuvier's description of the female which he had under his inspection. He gives the following as the dimensions of that specimen:—Length, from the summit of the head to the origin of the tail, 10 inches (French); tail 11 inches; head, from the muzzle to the occiput, 2 inches 3 lines; hand 2 inches; fore-arm 2 inches 9 lines; arm 3 inches; leg 4 inches; and thigh 3 inches 6 lines.

Habits entirely nocturnal. The Douroucouli spends the day in sleep, folded up with the head hidden between the fore-legs; but as soon as the brightness fades into twilight the animal awakes to activity. The eyes, which, if exposed to the full brilliancy of day, are darkened with excess of light, for the iris is then closed completely, perform their office as the shades of night approach, and the pupil then dilates nearly to the size of the eye.

Humboldt informs us that, in a state of nature, the Douroucouli hunts small birds, and also, especially, insects: it eats all sorts of vegetables, but is particularly fond of bananas, sugar-cane, the fruit of the palms, the nuts of the *Bertholettia* [BERTHOLETTIA], and the seeds of the *Mimosa Inga*. They do not live in societies, but pass their time together in pairs. Their nocturnal cry (*muh-muh*) resembles that of the Jaguar, and the whites who visit the missions of Oronooko call it *Titi-Tigre*. Its voice is of extraordinary power and volume when considered in relation to its size. Besides the Jaguar-like cry it has two others, one a species of mewing (*e-i-aou*), and a very disagreeable sound (*quer quer*) Its throat swells when it is irritated, and the animal then resembles in its dilatation and posture a cat attacked by a dog.

Humboldt's specimen, which he kept for five months, was lethargic during the day, sleeping from nine in the morning to seven at night (whence the species is called *Mono Dormillon*). Sometimes it would begin to slumber at daybreak, and always selected the most shady places; and, like squirrels and weasels, passed readily through small holes and openings. If roused during the day, its large eyes, which at night resembled those of the owl, were lustreless; and when it was wrapped up in the soundness of sleep, its mouth might be opened and its teeth examined with impunity. It was very fond of flies, and sometimes would even hunt for them on a dull day, capturing them with great skill. It drank but little, and sometimes passed twenty or thirty days without taking any liquid. It was kept at night in Humboldt's bed-room, notwithstanding the belief of the natives, that the Douroucoulis will tear out the eyes of sleeping persons. In a state of nature it is generally caught by the natives when sleeping in some hollow tree by day, and the male and female are often taken together.

M. F. Cuvier's Douroucouli was very mild in temper, which he attributes to the sex. He fed her on milk, biscuit, and fruit. Humboldt could not familiarise his.

M. F. Cuvier observes that the genus of which the *Douroucouli* is the type received the name of *Aotus* because the absence of external ears appeared to be its dominant character. This name, he remarks, can hardly be applicable to the animal now before us.

The affinities of this curious form to the *Sajous* and the *Loris* among the *Quadrumana* are shown by its fondness for insects, its nocturnal habits, and various parts of its organization. The last-named habits, its cat-like cries and appearance when excited, and other points, indicate its relation to the *Feræ*. Mr. Swainson notices this approach to the ferocious quadrupeds, and makes this the genus by which we are conducted from the *Cebidæ* to the *Lemuridæ*. In his 'Classification' he places the form in the latter group, between *Tarsius* and *Galeopithecus*.

Geographical Distribution.—South America. Humboldt saw the species in the forests bordering the Cassiquaire and

the woods at the base of Mount Duida; also in the vicinity of the cataracts of the Maypures.



Nocthora trivirgata.

NOCTI'LIO. [CHEIROPTERA, vol. vii., p. 25.]

NO'CTUA. (Ornithology.) [OWLS.]

NODE. The points of a planet's or comet's orbit in which it cuts the ecliptic, and the points in which the orbit of a satellite cuts that of its primary, are called the nodes of such planet, comet, or satellite. Generally the point in which one orbit cuts a second is called the node of the first *upon* the second.

NODDY. [BOOBY, vol. v., p. 159; TERNS]

NOE'TUS, a native of Ephesus or Smyrna, and contemporary with Origen, is chiefly known in ecclesiastical history for the heterodox opinions which he advanced respecting the Trinity. He appears to have believed in only one divine person, and to have denied the distinct and proper personality of the Word and Spirit. He is said by Epiphanius to have asserted that the Father was begotten, suffered, and died, and that in reality he was Christ. From this opinion Noetus and his followers were called Patripassians, that is, persons who believed that the Father alone had suffered for the sins of men; but it has been remarked by Beausobre (*Hist. de Manichée*, p. 533) with considerable truth, 'that this opinion is so absurd and so manifestly contrary to many texts of the New Testament, that it appears scarcely possible that it should be maintained by any reasonable man; which makes him suspect that this was not the opinion of those persons, but a consequence which the orthodox drew from their principles.' Noetus is also said to have maintained that he was Moses and that his brother was Aaron; but it is more probable, as Beausobre has remarked, that Noetus and his brother only pretended to defend the unity of God, as it had been taught by Moses and Aaron.

The followers of Noetus probably joined Sabellius, whose explanation of the doctrine of the Trinity was nearly the same as that of Noetus appears to have been.

(Mosheim's *Ecclesiastical History*, vol. i., p. 273, edition of 1826; Lardner's *Works*, vol. ii., p. 590-600, edition of 1831, and the authorities there cited.)

NOGAYS. The Nogays are a Tartar or Turkish nation, dispersed over the steppes which extend between the lower course of the river Dnieper and Mount Caucasus. The majority of the tribes belonging to this nation live along the Caucasian line, and find pasture for their herds and cattle in the adjacent steppes. That tribe however to which the name of Nogays is more especially applied has for more than fifty years been settled in the steppe which runs along the northern shores of the sea of Azof, on the banks of the rivers Berda and Molotshnia or Moloshnia. They have extensive pasture-grounds on the bottoms of the rivers, a circumstance by which they have risen to prosperity, though the better parts of this land have of late been taken from them and given to some German colonists. It is supposed that the nation settled in these countries at the time of the invasion of the Mongols in the thirteenth century, but some antient writers, especially Pomponius Mela, have left an account of the inhabitants of this region which so exactly applies to the Nogays, that it may be presumed they are the same nation. They lead a wandering life; and their small huts, which are made of felt, are placed upon a carriage and thus removed from one place to another. They have many head of cattle, horses, and sheep: those tribes which live along the Caucasian line also possess camels. They sow wheat and millet in a few places, but pay no further attention to it till harvest-time. Their principal food consists of horse-flesh and mare's milk. The language of the Nogays is a Turkish dialect, but it is said to differ considerably from that of the Tartars who inhabit the Crimea. (Pallas's *Travels through the Southern Provinces of the Russian Empire.*)

NOGENT, the name of several places. Nogent-le-Rotrou, the most important, is noticed elsewhere. [EURE ET LOIR.] Nogent-sur-Seine is described below: the others are too unimportant to require notice.

Nogent-sur-Seine is the capital of an arrondissement in the department of Aube. It is situated on the left bank of the Seine, and on the road from Paris to Troyes, 57 miles in a direct line east-south-east of Paris, or 63 miles by the road. It is opposite to an island in the channel of the river, which island is united to the opposite banks by two stone bridges of one arch each. The town is pleasantly situated, well built, clean, and tolerably well laid out. There are pleasant walks on the banks of the Seine. The town suffered severely in a battle which took place between the allied forces and the French in the year 1814. The town-hall and several houses were destroyed. There are an hospital, a theatre, and a church, that of St. Laurent, remarkable for a handsome steeple. The population of the commune in 1826 was 3325; in 1831, 3277; in 1836, 3355. Hosiery and cordage are manufactured; and there are several corn-mills on the Seine. The river is navigable, and wood, grain, flour, vinegar, wine, charcoal, slates, wool, &c. are sent down the stream to Paris: trade in flour is also carried on with the south of France. There are four fairs in the year. There are a subordinate court of justice and two or three government offices. There are handsome baths on the island in the river.

The arrondissement comprehends an area of 329 square miles, and contains 85 communes: it is divided into four cantons or districts, each under a justice of the peace. The population in 1831 was 32,213; in 1836, 33,856.

NOIRMOUTIER. [VENDEE.]

NOLA, a very antient and once flourishing town of Campania, is situated in a fertile plain between Mount Vesuvius on one side and the first ridge of the Apennines on the other, 14 miles east-north-east of Naples. It is said by Polybius (xi. 17) and others to have been built or colonised by the Etruscans, after their conquest of part of Campania, in the second or third century of Rome. Its Oscan or Etruscan name in the inscription found at Abella is 'Nuvlana,' and it is there mentioned as having community of rites and annual sacrifices with Abella, Abellinum, and Trebula. (Micali, *Storia degli Antichi Popoli Italiani*, chap. xiv.) After the defeat of the Etruscans by the Samnites, Nola is said to have been colonised by the Chalcidians from Cumæ, or from the island of Ænaria (Ischia). Silius Italicus (xii. 161) and Justinus (xx. 1) call Nola a Chalcidian colony. Nola, having joined the Samnites against Rome, was taken by the consul C. Junius Bubulcus, or, according to others, by the dictator Pœtelius (Livy, ix. 28), 311 B.C. After this Nola appears to have continued under its own magistrates and senate as a municipium and an ally of Rome. In the second Punic war we find the senate of Nola wishing to remain faithful to Rome, whilst the people wanted to open the gates to Hannibal. (Livy, xxiii. 14, 15.) Marcellus, the Roman commander, having entered Nola, won over Bantius, one of the popular leaders, who informed him of the secret intelligence between his countrymen and the Carthaginians. When Hannibal approached the town, expecting the gates to be opened to him, Marcellus suddenly issued with his troops from one of three gates, and fell upon the Carthaginians, who were taken by surprise, and obliged to retire with the loss of several thousand men. This was the first action in which the Romans defeated Hannibal. (Livy, xxiii. 16.) Nola is mentioned as a Roman

colony in the Social War, when it was taken by the Samnites, who killed the prætor L. Posthumius. (Livy, *Epitome*, 73.) It was afterwards retaken and devastated by Sulla. Augustus, in his last journey into Campania, being taken ill, was carried to Nola, where he died, August 19, A.D. 14.

The present Nola, which is much smaller than the former town, is about one mile in circumference, and has walls and five gates. It is a bishop's see, and has several churches and convents, and some other good buildings, a fine market-place, a large barrack for cavalry, and about 9000 inhabitants. It is reported that a bishop of Nola towards the end of the fourth century was the first to introduce the use of bells for calling the people to church. In the neighbourhood of Nola a quantity of antient vases or pottery have been found, which are known by the names of Campanian or Nola vases; they somewhat resemble the old Etruscan pottery. (Leo Ambrosius, *De Nola Opusculum*, 1514; Remondini, *Storia Ecclesiastica Nolana*, 1747; Swinburne; Neigebaur.)

Nola is the head town of one of the five districts into which the province of Terra di Lavoro is divided, and which at the census of 1825 contained 117,567 inhabitants. (Peroni, *Censimento dei Reali Dominii*.)

NOLLE PROSEQUI is a phrase used in proceedings at common law to denote the voluntary withdrawal of the plaintiff or other originating party in a judicial proceeding from the further prosecution of his suit, and is derived from the words used in the formal entry of such withdrawal on the record, in which the party 'acknowledges that he will not further prosecute' (fatetur se ulterius *nolle prosequi*). In an action, if the plaintiff enter a nolle prosequi, the defendant is entitled to his costs under stat. 8 Eliz., c. 2, s. 2. The same mode of proceeding does not exist in courts of equity, but the complainant can at any time discontinue his suit upon an application to the court, and paying the costs of the defendant. In criminal prosecutions by indictment, though originated by private persons, a nolle prosequi may be entered at any stage of the proceedings by the king's attorney-general, but it cannot be done without his concurrence, although the prosecutor desires it. It is very unusual however in modern times for the attorney-general to enter a nolle prosequi upon an indictment, except upon the application of the prosecutor. Lord Holt says 'the practice began in the reign of Charles II., and that in all Charles I.'s time there was no precedent of a nolle prosequi upon an indictment.' (6 *Modern Reports*, 262.) But there can be no doubt of the power of the attorney-general to put an end to criminal *informations* filed *ex officio* by him; and in the case of informations filed in the Crown-office by the Court of King's Bench, a nolle prosequi may be entered by the master of the Crown-office upon the application of the prosecutor and with the leave of the court. The effect of a nolle prosequi in criminal cases is to discharge the defendant for the time, but it does not operate as an acquittal; so that he may be indicted again, and it is said that even upon the same indictment fresh process may be awarded.

NOLLEKENS, JOSEPH, though a native of this country, where he was born in Dean-street, Soho, London, August 11, 1737, was of foreign extraction; his father, Francis Joseph, who was an artist of much ability for compositions of landscape and figures after the manner of Watteau, was a native of Antwerp. The senior Nollekens died January 21, 1748, and his widow soon after married again and went to reside in Wales. These circumstances may serve to account for Joseph's neglected education, for his literary attainments scarcely extended to an ordinary knowledge of reading and writing; nor does he appear to have endeavoured in after-life to make up for his deficiencies. It is therefore rather matter of astonishment that he should have been able to accomplish what he did in the superior branch of his art, than that his poetical subjects should have displayed so little of the higher powers of imagination.

At the age of thirteen he was placed with Scheemakers, the sculptor, and while with him obtained some prizes from the Society of Arts, who afterwards voted him fifty guineas, while he was at Rome, for his Timoclea before Alexander. He set out for Rome in 1760, and while there was noticed by some of his countrymen, among others, by Garrick and Sterne, both of whom sat to him for their busts. That of Sterne, which was in terra-cotta, was, for likeness and character, equal to any which he afterwards produced. In Rome he turned his attention also to a rather lucrative if not particularly dignified branch of art, namely, that of manufacturing antiques, by vamping up fragments, finding either heads and limbs for bodies, or bodies for heads and limbs; one of the statues thus compounded was the Minerva, afterwards purchased for a thousand guineas, and now in the Newby collection in Yorkshire. His dexterity and skill in repairs of this kind were subsequently displayed in some of the Townley Marbles. While at Rome he also purchased for a mere trifle, of the workmen by whom they were discovered, a number of fine terra-cottas, which he afterwards disposed of to Mr. Townley, and which are now let into the walls at the British Museum. Among those whose patronage he obtained during his stay in Italy were Lord Yarborough and the Earl of Besborough, for the former of whom he executed a group of Mercury and Venus chiding Cupid.

After about ten years of study in Italy, which had been profitable to him in all senses of the term, he returned to London with habits of economy well calculated to keep what he had acquired and to ensure still further wealth. He established himself in Mortimer-street, became an associate of the Royal Academy, and was shortly afterwards honoured by the king's sitting to him for his bust. This circumstance, and the celebrity which his busts of Garrick and Sterne had previously obtained, perhaps as much on account of their subjects as of their own merit, caused him to be almost overwhelmed with employment of that kind: he had sometimes three or four sitters in the course of one day. Whether this application to the mere taking of likenesses did not tend to render him more studious of the mechanical than the intellectual part of his art, it would be difficult to decide; but it was certainly congenial to his inclination, because it was productive of immediate profit, and suited also to his abilities. The tide of fashion being once in his favour, that oddity of his address and bluntness of manners and speech, which might else have proved disqualifications for that branch of his profession, probably contributed in no small degree to recommend him to those who, accustomed to courtesy and polish of manners in their own circle, were willing to amuse themselves with the oddities of one who had obtained a kind of privilege for freedom of tongue However deficient in education, Nollekens was by no means so either in shrewdness or tact: there can therefore be little doubt he soon perceived that people were more diverted than offended by his bluntness. If he had found that his disregard to the forms of courtesy frightened away the polite and the fashionable from his studio, Joseph would quickly have adopted a very different course, and have become the blandest of the bland.

He had also a good deal of employment in a branch of the art still less favourable than that of bust-making for the display of its higher powers, namely, that of common-place monuments of common-place people, records of persons whom the world did not care to recollect. In such subjects almost the only inspiration that an artist can feel springs out of pecuniary remuneration; yet there were exceptions even in this case, for the monument to Mrs. Howard of Corby Castle is one of his best productions, pathetic in conception, elegant and tasteful in execution; as a work of art, very far superior to that by him of Captains Manners, Bayne, and Blair in Westminster Abbey, which, though a sumptuous, is but a frigid and mechanical work. Notwithstanding both his occupations of this kind and his numerous commissions for busts, Nollekens found time to undertake several statues and pieces of poetic sculpture, among which were no fewer than five Venuses, one of them since known by the name of the Rockingham Venus, and one representing the goddess anointing her hair, which last was reckoned by the artist himself to be his master-piece, and hardly inferior to the antique. Among his groups were a Pætus and Arria and a Cupid and Psyche.

While wealth was pouring in upon him year by year, his expenses by no means kept pace with it, nor were they at all increased by his marriage; for the lady he selected, Miss Mary Welch, though of some beauty and accomplishments, was still more remarkable for her rigid economy. So far the match was a very suitable one, for, although wealthy and childless, both the husband and wife carried their notions of frugality even to penuriousness.

After the death of his wife in 1817, Nollekens began to relax a little of that economy which had before prevailed in his establishment; but it was then too late for him to think of beginning to enjoy the wealth which he had accumulated, and which he then discovered only served to draw around him

swarm of greedy legacy-hunters, all professing attachment and sympathy—all eagerly looking forward to the time when his will should be opened. On the 23rd April, 1823, the event so long and anxiously expected took place, and Nollekens expired at the age of eighty-six, dividing, with the exception of a few legacies (amounting to about 6000*l.*), the whole of his vast property (somewhat more than 200,000*l.*) between his friends, Francis Palmer, and Francis Douce, the well-known antiquary, and leaving to each of his executors, Sir W. Beechey and Thomas Smith, only 100*l.* each. Smith, who had been in the sculptor's studio, had expected a very considerable legacy; consequently it is not a matter of much surprise if his biography of the old sculptor is entirely free from that admiration of his subject which most biographers entertain. Nollekens had many good qualities, and one of his worst ones was that of indulging in excessive economy when economy had ceased to be a merit.

NOMBRE DE DIOS. [MEXICAN STATES.]

NOMINALISTS, a sect of the scholastic philosophers, so named on account of the particular tenet by which they were distinguished, and in opposition to the Realists, another scholastic sect. In order to understand the principal point of difference between these parties, which gave rise to long-continued and acrimonious disputation, it is necessary to advert to the doctrines of the ancient philosophy concerning ideas or universals. According to Plato, who appears to have been indebted for his opinion to the Pythagorean school, universals, or, as he called them, ideas, by which are to be understood such things as we express by general terms, have, apart from the mere conception of them by the understanding, an actual and eternal existence in the Divine Mind; and are the patterns or models according to which the individuals of every species are formed, and by which the constitution of each individual is determined. The separate existence of these essences was denied by Aristotle, who taught that forms—which word as employed by him has the same meaning with the ideas of Plato—were eternally united to matter; that unconnected with it they have no existence, and that they are inherent in their objects. Zeno and the Stoics generally ridiculed the belief in such universal natures altogether; and held that the forms of the Stagyrite and the ideas of his preceptor were nothing if distinguished from the notions of them in the mind and the words by which they are designated. The doctrine of Aristotle was universally received among the schoolmen, until after the commencement of the eleventh century. But with the revival of dialectic science, which about this time occurred, it began to be warmly controverted. Those who adopted the Stoical doctrine, and affirmed that words or names only were universal, were termed Nominalists; while those who adopted the Peripatetic opinion, and maintained the proper existence of universals, were termed Realists. The honour of forming the sect of the Nominalists is commonly assigned to Roscelin, canon of Compiègne; but its real founder appears rather to have been John called the Sophist, and supposed by Du Boulay, the historian of the Parisian Academy, to have been chief physician to king Henry I. of France. Be this however as it may, to Roscelin unquestionably belongs the credit of having first raised the sect into eminence. The Nominalist doctrine was highly obnoxious to most of the divines as well as the philosophers of the period, chiefly perhaps, as Brucker supposes (*Historia Critica Philosophiæ*), on account of Roscelin having employed it in illustrating the mysterious constitution of the Divine Nature, and thereby laid himself open to the charge of heresy. Notwithstanding the opposition, originating in this source, which it encountered, many converts were made; and its advancement was greatly promoted by the genius and learning of the celebrated Abelard, who was one of the disciples of Roscelin. So successful was he in his disputes with William de Champeaux, styled 'the venerable doctor,' who flourished about the beginning of the twelfth century, and was then the principal supporter of Realism, that the pupils of the latter in large numbers forsook their master, and became the followers of his more eloquent antagonist. Throughout the whole of the twelfth century the contest between the rival sects continued to be waged. Both parties, by various modifications of their leading doctrines, gradually became divided to a considerable extent among themselves, and a third sect arose, professing to steer a middle course between them, the adherents of which were distinguished by the name of Conceptualists, on account of their holding universality to be the attribute, not of names only, but of conceptions. This sect however obtained but a small share of notice. At this period the Realists, both in number and respectability, had the advantage of their opponents, and the erudition and subtlety of Albert the Great, Thomas Aquinas, and afterwards of Duns Scotus, gave them such a decided predominance, as to throw the Nominalists completely into the shade. In the fourteenth century William Occam, an English Franciscan friar, and a pupil of Scotus, becoming the advocate of Nominalism when it was seemingly about to expire, effected a revival, and brought it into greater repute than it had ever before enjoyed. The discussion of the question respecting universals was once more renewed, with the utmost virulence and animosity on both sides. Blows were resorted to when argument was exhausted; and not unfrequently debates were terminated by bloodshed. Throughout Germany the opinion of the Nominalists was soon almost universally received, while Realism, being supposed to be more consistent with the doctrines of the church, and patronised by successive popes, prevailed in Italy and other countries where the influence of the Roman see was most powerfully felt. Although numbering among its defenders fewer persons of philosophical eminence than were to be found among the leaders of the opposite cause, it still maintained its wonted predominance. John, the twenty-third pope of that name, having finished his disputes with the Franciscans, who had zealously opposed him on certain matters affecting the privileges of their order, directed severe persecutions against the Nominalists. In the year 1339 the university of Paris published an edict, denouncing the philosophy of Occam, the effect of which however does not seem to have been very hostile to its wider extension. Louis XI. of France, in 1473, likewise issued an edict against the Nominalists, in which it was ordered that their writings should be seized and secured in the libraries by iron chains, to prevent their being perused. The consequence was, that the leaders of the sect fled to England and Germany. In the following year Louis mitigated his edict, which he had issued at the suggestion of the bishop of Avranches, and permitted the study of the Nominalist writings. Thereafter this sect obtained the ascendency in the universities of France, as it had formerly obtained it in those of Germany. The Reformation, to which a long train of causes had been effectually conducting, put an end to the controversy so long and so fiercely carried on between the two most memorable parties that have ever arisen among the schoolmen, and the contemporaneous revival of letters eventually gave the death-blow to the scholastic philosophy. Among the most eminent supporters of Nominalism, besides those already referred to, may be mentioned Suisset, Buridan, Marsilius ab Inghen, and Oresmius, in the fourteenth century, and Matthew of Cracow, Gabriel Biel, &c., in the fifteenth.

NOMINATIVE. [CASE.]

NOMSZ, JAN, a Dutch poet, born at Amsterdam in 1738, acquired some distinction by his epic or rather historical poem of 'William I., or the Foundation of the Freedom of the Netherlands,' in twenty-four books, 1779. This production contains passages of great force and beauty, but for what interest it possesses as a whole it is indebted to the materials themselves. As a dramatic writer, Nomsz showed greater talent, especially in his tragedies 'Cora,' 'Zoroaster,' the 'Duchess of Coralli,' and 'Maria van Lalain.' This last-mentioned piece became exceedingly popular, and retained possession of the stage for a long while, the part of the heroine being frequently performed by Madame Wattier-Ziesenis (born at Rotterdam, April 13, 1762, died April 23, 1827), one of the most accomplished women and one of the greatest tragedians of her time, though a Siddons and a Talma were her contemporaries.

Besides some other original tragedies, Nomsz translated several from the French; among the rest Racine's 'Athalie.' He also produced a comedy which is mentioned with commendation by Van Kampen. His miscellaneous pieces and translations, among which that of La Fontaine's 'Fables' ought not to be forgotten, display likewise much talent and charm by a certain happy ease and naturalness and by their merits of style and versification. Like Camoens, he breathed his last within the walls of an hospital, St. Peter's almshouse at Amsterdam, where he died in 1803, at the age of sixty-five. After all, there is reason for supposing, from a remark of De Vries's while speaking of his writings, that the poverty

of his later years was in some measure occasioned by his own want of prudence.

NONAGESIMAL. The nonagesimal degree of the ecliptic is that point of the ecliptic which is highest above the horizon. Every point of the ecliptic is therefore the nonagesimal degree in succession.

NONAGON. [POLYGONS, REGULAR.]

NONCONFORMITY is the term employed to designate Protestant dissent from the Church of England. It was in the reign of Edward VI. that the English reformed church first received a definite constitution. During the time of Henry VIII. it remained in a great measure unsettled, and was subject to continual variation, according to the caprice of the king. As organised by Edward, while Calvinistic in its creed, it was Episcopalian in its government, and retained in its worship many of those forms and observances which had been introduced in the days of Roman Catholic ascendency. In the first of these particulars it resembled and in the last two it differed from the Genevan church. During the temporary restoration of the Roman Catholic faith under the administration of Philip and Mary, great numbers of the persecuted disciples of the reformed faith sought refuge in France, the Netherlands, Switzerland, and other parts of the Continent. Of those who fled to Germany, some observed the ecclesiastical order ordained by Edward; others, not without warm disputes with their brethren, which had their commencement at Frankfort, adopted the Swiss mode of worship, preferring it as more simple, and more agreeable to Scripture and primitive usage. Those who composed this latter class were called Nonconformists. The distinction has been permanent, and the name has been perpetuated. Queen Elizabeth's accession to the throne, in 1558, opened the way for the return of the exiles to the land of their fathers. It was natural for each of the parties of which they consisted, to advocate at home the systems of worship to which they had been respectively attached while abroad; and the controversy, which had been agitated by them in a foreign country, immediately became a matter of contention with the great body of Protestants in their own. It suited neither the views nor inclinations of the illustrious princess who then held the sceptre to realise the wishes of the Nonconformists, or Puritans, as they began to be called, by giving her sanction to the opinions which they maintained, and assenting to the demands which they made. The plain and unostentatious method of religious service which they recommended did not accord with that love of show and pomp for which she was remarkable; and the policy of the early part of her reign, in which she was supported by the high dignitaries both in the church and state, was to conciliate her Roman Catholic subjects, who, in rank, wealth, and numbers, far exceeded the Nonconformists. The liturgy of Edw. VI. having been submitted to a committee of divines, and certain alterations, betraying a leaning to popery rather than to puritanism, having been made, the Act of Uniformity was passed, which, while it empowered the queen and her commissioners to 'ordain and publish such further ceremonies and rites' as might be deemed advisable, forbade, under severe penalties, the performance of divine worship except as prescribed in the Book of Common Prayer. This act was only partially carried into effect from the time of its being passed, in 1558, to 1565. But in 1565 it began to be rigidly enforced, and many of the Nonconformists were deprived of their preferments (for notwithstanding their sentiments, most of them had still remained in connection with the Established Church, being from principle averse to an entire separation); many also were committed to prison. The High Commission Court, tyrannical in its very constitution, became still more severe in the exercise of its functions; and at length, in 1593, the parliament declared that all persons above sixteen years of age who should absent themselves for one month from the parish church should be banished the kingdom; and if they returned without licence, should be sentenced to death as felons. These provisions, though directed principally against the Catholics, affected the Protestant Nonconformists with equal severity; and with reference both to Catholics and Protestants who dissented from the Church of England, were unjust and impolitic. The Nonconformists, during the age of Elizabeth, are not to be regarded as an unimportant faction. Both among the clergy and the laity they were a numerous body; and they would have been powerful in proportion to their numbers, had they only been more closely united among themselves. A motion, made in 1561, at the first convocation of the clergy which was held in England, to do away with the ceremonies and forms to which the Puritans objected, was lost by a majority of only one, even though the queen and the primate Parker were well known to be opposed to such a change. In the Commons the Puritan influence was strong; and if that house be supposed, in any adequate degree, to have represented the people for whom it legislated, their numerical force throughout the country generally must necessarily have been great. Without presumption therefore they might have expected that their remonstrances would be listened to, and their grievances redressed. And certainly it would have been wiser in the government to have endeavoured to secure their support than to have awakened their discontent and provoked their opposition; more especially when the hostile aspect of foreign nations is considered, and when we remember that the English Catholics, whose numbers and power rendered them particularly formidable, were eagerly watching every symptom favourable to the re-establishment of the antient faith. Nor would it have been a difficult matter to yield to the claims of the Nonconformists. The moderate among them sought not the overthrow of the ecclesiastical constitution, but contended merely that certain rites and observances, which they regarded as departures from the purity and simplicity of Christian worship, should be dispensed with; and, generally, that matters commonly recognised as things indifferent should not be insisted on as indispensable. Doubtless many were less reasonable in their demands, and injustice and persecution tended much to increase their number. A party, at the head of which was Professor Cartwright, of Cambridge, desired a change, not only in the forms of worship, but in church polity also, and would have substituted Presbytery in the room of Episcopacy. Another party, viz. the Independents, or Brownists, as they were then termed, going still further, wished the disseverment of the connection between church and state altogether. Still there is every reason to believe that slight concession to the demands of the less violent, and the display of a spirit of forbearance, would have satisfied many, would have allayed the dissatisfaction of all, and would have been the reverse of disagreeable to the country generally. Unfortunately an opposite course of policy in this and subsequent reigns was chosen; which ultimately conducted to the horrors of a civil war, the subversion of the regal authority, and those disastrous events which make the history of the seventeenth century one of the most melancholy pages of our national annals.

Queen Elizabeth died in 1603, and was succeeded by James VI. of Scotland. From one who like him had been the member of a Presbyterian church, and had on more than one occasion expressed his decided attachment to its principles and worship, the Nonconformists, not without reason, expected more lenient treatment than they had met with in the preceding reign. But their expectations were bitterly disappointed. In compliance with their petitions, a conference was indeed appointed and held at Hampton Court, at which nine bishops and as many dignitaries were present on the one side, and four Puritan ministers, selected by James, on the other. The king himself presided and took part in the debate. But no good results ensued. The Nonconformist representatives were loaded with insults, and dismissed in such a manner as might well give birth to the darkest anticipations regarding the fate of the party to which they belonged. Shortly after, a few slight alterations of the national rubric were made, and a proclamation issued requiring the strictest conformity. In 1604 the book of canons was passed by a convocation, at which Bishop Bancroft presided. It denounced severe temporal and spiritual penalties against the Puritan divines, and was followed up by unsparing persecutions. In spite however of all the means employed for its eradication, the cause of Nonconformity advanced. In the church itself there were many of the clergy who held the Puritan opinions, though they deemed it inexpedient to make a very open display of them, and who sighed for a change; and the number of such was largely augmented by the alteration which James made in his creed, from Calvinism to the doctrines of Arminius.

The son and successor of James, Charles I., adopted towards the Nonconformists the policy of his predecessors. His haughty temper and despotic disposition speedily involved him in difficulties with his parliament and people. In carrying into execution his designs against Puritanism,

he found an able and zealous assistant in Archbishop Laud, under whose arbitrary administration the proceedings of the Star Chamber and High Commission Court were characterised by great severity. Many Puritans sought for safety and quiet in emigration; and the colony of Massachusetts Bay was founded by them in the New World. But a proclamation by the king put a stop to this self-banishment; and thus even the miserable consolation of expatriation was denied. Hundreds of Puritan clergymen were ejected from their cures, on account of their opposition to the Book of Sports, published in the previous reign. Calvinism was denounced by royal authority, and severe restrictions laid on the modes and times of preaching. But a change was approaching. In 1644 Laud was declared guilty of high treason and beheaded; and about five years after, Charles shared the same fate. The parliament abolished Episcopacy and every thing in the Church that was opposed to the model of the Genevan church.

During the Protectorate, Presbytery continued to be the established religion. Independency however prevailed in the army, and was in high favour with Cromwell. Under his government the sects of the Quakers and Baptists flourished; and other sects, some of which held the wildest and most visionary tenets, sprung into existence. All were tolerated. Episcopacy only was proscribed; and the Nonconformists, in their hour of prosperity, forgetful of the lessons which adversity should have taught them, directed against its adherents severities similar to those of which they themselves had been the objects. The Restoration, in 1660, placed Charles II. on the throne of his ancestors, and led to the restitution of the old system of church government and worship. The Act of Uniformity was passed in 1662, by which all who refused to observe the rites as well as subscribe to the doctrines of the Church of England were excluded from its communion, and in consequence exposed to many disadvantages and to cruel sufferings. During the same reign was passed the Conventicle Act, which subjected all who presumed to worship God otherwise than the law enjoined to fine and imprisonment, and punished the third offence with banishment; the Five-Mile Act, which banished to that distance from every corporate town the Nonconformist clergy, and forbade them to officiate as schoolmasters except on condition of their taking the oath of passive obedience; and the Test Act, which, though directed against the Roman Catholics, pressed with equal severity against Protestant dissenters, and excluded from offices of trust in the state those who refused to receive the eucharist according to the rubric of the Church of England. After this time dissent continued in a very depressed state, and had to struggle with various fortunes, until the reign of William III., when the Toleration Act gave immunity to all Protestant Dissenters, except Socinians, from the penal laws to which they had been subjected by the Stuart dynasty. The benefits conferred by this measure were indeed subsequently much abridged by the Occasional Communion Bill, which excluded from civil offices those Nonconformists who, by communion at the altars of the Church, were by the provisions of the Test Act qualified to hold them; and by the Schism Bill, which restricted the work of education to certificated churchmen. After the accession of George I. however, these laws were repealed, and since then, by the removal of the Test Act, and by the passing of the acts relating to registration and marriage, dissenters have been allowed the peaceable enjoyment of the rights of conscience. It would be a task of some difficulty to enumerate the various sects which may be classed under the general head of Nonconformists. The chief denominations are the Presbyterians, Independents, Baptists, Wesleyan and Calvinistic Methodists, and Quakers. [BAPTISTS; DISSENTERS, &c.]

NONES. [KALENDAR.]

NO'NIUS MARCELLUS, a Roman grammarian, was born at Tibur, in the fourth century. He was the author of a small work entitled 'Compendiosa Doctrina de Proprietate Sermonum,' which was written for the use of his son, and is chiefly valuable for the quotations which it contains from old Latin writers. This work has been edited by Mercer, Paris, 1614, which edition has been republished at Leipzig, in 1826.

NONIUS. [NUNEZ.]

NONJURORS. [THEOLOGY.]

NONNUS (Νόννος), an inhabitant of Panopolis, in Egypt, lived at the beginning of the fifth century of the Christian æra. We have no particulars respecting his life, except that he became a Christian when he was advanced in age. He was the author of two works in Greek, which have come down to us, the 'Dionysiaca' and a Paraphrase, in verse, of the Gospel of St. John. The 'Dionysiaca' gives an account of the adventures of Dionysus from the time of his birth to his return from his expedition into India; and the early books also contain, by way of introduction, the history of Europa and Cadmus, the battle of the giants, and numerous other mythological stories. This work, which consists of 38 books, and is written in hexameter verse, has been condemned by Daniel Heinsius, Joseph Scaliger, and other critics, for its inflated style, and has been pronounced to be unworthy of perusal; but it must be admitted that it contains passages of considerable beauty, and supplies us with information on many mythological subjects which we should not be able to obtain elsewhere. It appears probable that this work was written before Nonnus became a Christian. The best edition of the 'Dionysiaca' is that by Graefe, 2 vols. 8vo., Leip., 1819-1826. D. Heinsius wrote a dissertation on this author, which was published at Leyden, in 1610, with the text of the 'Dionysiaca.' Six books of this poem, from the eighth to the thirteenth inclusive, were published by Moser, with a preface by Creuzer, Heidel., 1809. A French translation of the 'Dionysiaca' was published at Paris in 1625.

The 'Paraphrase of St. John,' which is a poor performance, and has been roughly treated by Heinsius, in his 'Aristarchus Sacer,' Leyden, 1627, was published for the first time at Venice, in 1501. The best edition of it is by Passow, Leip., 1834. This work however is of some value, as it contains a few important readings, which have been of considerable use to the editors of the Greek Testament. It omits the history of the woman taken in adultery, which we have at the beginning of the eighth chapter of St. John's Gospel, and which is considered by Griesbach and many other critics to be an interpolation. In chap. xix. 14, Nonnus appears to have read 'about the *third* hour,' instead of 'about the *sixth*.' (See Griesbach on the passage.)

There are also extant a 'Collection of Histories or Fables,' which are cited by Gregory Nazianzenus, in his work against Julian, and which are ascribed by some critics to the author of the 'Dionysiaca.' But Bentley, in his 'Dissertations on Phalaris,' has given good reasons for believing that this Collection was composed by another individual of the same name.

There were several other writers of the name of Nonnus, of whom an account is given in Fabricius, *Bibl. Græca*, vol. viii., p. 601, 602, ed. Harles.

NONNUS (sometimes called Nonus), a Greek physician, and author of a medical work still extant, entitled *ἐπιτομὴ τῆς ἰατρικῆς ἁπάσης τέχνης*, 'Compendium totius Artis Medicæ.' Nothing is known of his life, except that he composed his work at the express command of the emperor Constantinus Porphyrogennetus (to whom also it is dedicated), who was most probably the seventh of that name, who died A.D. 959. His real name is supposed by Freind (*Hist. of Physic*), Sprengel (*Hist. de la Méd.*), and Bernard (*Præfat. ad Theoph. Non.*), to be Theophanes, as he is called so in one manuscript, and a physician of that name is found to have lived in the tenth century. In three manuscripts the work is anonymous, and there is only one which mentions the name of Nonnus. This epitome is divided into 297 chapters, and contains a short account of most diseases and their treatment. It contains very little that is original, and is almost entirely compiled from Aëtius, Alexander Trallianus, and Paulus Ægineta: from whom whole sentences are sometimes transcribed with hardly any variation. The greater part of the chapter on Pleurisy (ch. 129) is taken from Paulus Ægineta, lib. iii., cap. 33; part of that on Melancholy (ch. 32) from Alexander Trallianus, lib. i., cap. 16; and all that is valuable about Hydrophobia (ch. 271) is contained in Paulus Ægineta, lib. v., cap. 3. Almost the only point worthy of notice in the work is, that it is the first medical treatise in which any mention of distilled rose-water is to be found; it seems to be meant by the word *ῥοδόσταγμα*, in the ninety-seventh chapter. There are only two editions of this work. The first was published Argentor., 1568, 8vo., Gr. and Lat.; the editor was Jeremiah Martius, and the author's name is written *Nonus*. The last and best was edited by J. S. Bernard, and published after his death, in two vols. 8vo., Gotha and Amsterdam, 1794, 1795, Gr. and Lat., with copious and learned notes by the editor.

NONSUIT. If a plaintiff, having commenced a civil action at the common law of England, is guilty of any neglect or default in prosecuting such action according to the practice of the court in which it is brought, he is adjudged *not to follow* or pursue his remedy, and a judgment of non prosequitur, or *nonsuit*, is entered, upon which he becomes liable to pay costs to the defendant, and in antient times a fine to the king for making a false complaint. This is the general meaning of the term; but according to modern practice it has a more limited signification, the phrase non pros (non prosequitur) being now used to describe the consequence of most of those defaults on the part of the plaintiff which were formerly comprised under the general term nonsuit. Antiently, when it was the practice for the jury to stand at the bar of the court to hear the evidence on a trial, they withdrew, after the judge had summed up the proofs, to deliberate upon their verdict. On coming back to the bar to deliver their verdict, and before they delivered it, the plaintiff was called in order to be ready to answer the fine which became due to the king for his false complaint, in case the decision was against him; and if, upon this call, he did not appear, no verdict could be given upon the evidence either for the plaintiff or the defendant, and the former was said to be nonsuited. Hence arose a practice that when the plaintiff perceived that the evidence given was insufficient to support his action, and that the verdict would probably be against him, he voluntarily withdrew himself, and did not appear when called; the consequence of which was a nonsuit, which was less disadvantageous to him than a verdict for the defendant, as it did not preclude him from bringing a new action. This practice led to a further innovation upon the antient proceeding, and it has long been the usual course for the judge to order the plaintiff to be called, or, in other words, to direct a nonsuit, if, upon the whole of the case in support of the action, he is of opinion that there is no evidence upon which the jury would be justified in finding a verdict for the plaintiff. In consonance to the antient practice however, by which the plaintiff might in all cases appear when called to answer for his fine, and so prevent a nonsuit, he cannot at the present day be *compelled* to be nonsuited, and therefore he may, if he pleases, insist upon the evidence being left to the decision of the jury. It is to this practice of calling the plaintiff, when his evidence, as delivered in court, is insufficient to support his action, that the term nonsuit is now restricted. The consequences of a nonsuit are, that the jury are discharged from finding a verdict, and the plaintiff pays the costs of the suit; but he is still at liberty to commence a new action against the defendant upon the same matter, if he should afterwards be provided with more complete evidence.

Besides the judgment of nonsuit, the judges of the courts of record at Westminster are authorised by stat. 14 Geo. II., c. 17, to give judgment *as in case of a nonsuit*, where the plaintiff has made default in bringing an issue to be tried according to the course and practice of the said courts.

NONTRONITE—*Silicate of Iron.* This mineral occurs in small nodules imbedded in an ore of manganese. Its colour is pale or greenish-yellow. Fracture earthy. Dull. Opaque. Unctuous to the touch and very tender. It is found in the department of Dordogne in France, in the arrondissement of Nontron.

Analysis by Berthier:—Silica, 44; peroxide of iron, 29; alumina, 3·6; magnesia, 2·1; clay, 1·2; water, 18·7.

NOODT, GERARD, born at Nimwegen in 1647, studied first in his native town, and afterwards at Leyden, Utrecht, and Franeker, where he took his degree in law. He distinguished himself as a jurist, and was made professor of law successively at Franeker, Utrecht, and at Leyden. He studied and taught jurisprudence in an enlightened and philosophical spirit. Averse from dogmatism, he readily acknowledged his ignorance on questions which he could not solve. He was well acquainted with the Roman Jurists, as well as with the other Roman writers, especially the historians, upon whose model he formed his own Latin style, which is remarkably pure. His chief works are:—1, 'Probabilium Juris Civilis Libri iv.;' 2, 'De Jurisdictione et Imperio Libri ii.;' 3, 'Ad Legem Aquiliam Liber Singularis;' 4, 'De Fœnore et Usuris Libri iii.,' in which he contends that usury is not contrary to the natural law, and is not forbidden by Divine law. The author traces the history of the Roman law on this subject. 5, 'Diocletianus et Maximianus, sive de Transactione et Pactione Criminum Liber Singularis,' in which he refutes the opinion of some, that a transaction or compromise in capital or felonious criminal cases was allowed by the Roman law; 6, 'Observationum Libri Duo, in quibus complexa Juris Civilis aliorumque Veterum Scriptorum Loca aut illustrantur aut emendantur;' 7, 'De Usufructu Libri ii.;' 8, 'Ad Edictum Prætoris de Pactis et Transactionibus Liber;' 9, 'Julius Paulus, sive de Partus Expositione et Nece apud Veteres Liber,' in which he maintains that the Roman laws gave to parents the power of exposing or putting to death their infant children, and that this power was only taken away by the emperors Valentinianus, Valens, and Gratianus. This assertion being combated by Bynkershoek, Noodt replied to him in his 'Amica Responsio,' in which he confirms his former assertion by new arguments and authorities. 10, 'De Causis Corruptæ Jurisprudentiæ; 11, 'De Jure Summi Imperii et Lege Regia Dissertatio;' 12, 'De Religione ab Imperio Jure Gentium Libera.' These last dissertations were translated into French by Barbeyrac, and published under the title of 'Du Pouvoir des Souverains et de la Liberté de Conscience,' Amsterdam, 1707. 13, 'Commentarius ad Digesta, seu Pandectas,' which he continued to the 27th book, when he was stopped by death. Noodt died at Leyden in 1725. He ranks among the most distinguished jurists of modern times; and his works display a deep acquaintance with the law and social state of the Romans. His works have been collected and published in 2 vols. fol., Leyden, 1735, with a biography of the author by Barbeyrac.

NOOTKA SOUND is a large bay on the western shores of the island of Quadra and Vancouver, which is on the north-west coast of North America. But Humboldt, in his work on Mexico, states that, according to the survey made by the Spaniards Espinosa and Cevallos, this bay is not in the large island, but in a smaller one, which is separated from Quadra and Vancouver Island by the narrow strait of Tasis. This bay extends in a north-north-eastern direction about ten miles inland between 49° 30′ and 49° 40′ N. lat. and between 127° and 128° W. long., and has a wooded island in its middle. It branches off into several smaller bays or coves, one of which, where Capt. Cook remained some time on his last voyage, and which was called Friendly Cove, has a narrow entrance, but makes a safe harbour, being bounded on all sides by high and wooded land. This cove is near the entrance of the bay. The Spaniards formed a small settlement here in 1789; but as their claims to the country were disputed by the English, they gave it up to them. The English government maintained this settlement for some years, but at last abandoned it. On the shore of the island the land may be considered as low compared with other parts of the north-western coast of America. It presents an alternation of rocky cliffs and sandy beaches; and at the back of the shores there are many detached rocks which are covered with pine-trees. The surface of this low country is very uneven; and at no great distance from the sea it is bounded by a compact mass of rugged mountains, whose summits are covered with snow. (*Voyages* of Cook, Dixon, Meares, and Vancouver.)

NORD, a department in the north (as its name implies) of France, stretching along the Belgian frontier. It is bounded on the north-east and east by Belgium, on the south-east by the department of Aisne, on the south and south-west by those of Somme and Pas de Calais, and on the north-west by the German Ocean. Its form is irregular. Its greatest length is from west-north-west (Gravelines on the banks of the Aa) to east-south-east, near the source of the river Petite Helpe, 114 miles; its greatest breadth, at right angles to the length, is from the neighbourhood of Honnecourt to that of Condé, both on the Escaut, 39 miles. The area is estimated at 2199 square miles. In size it is rather below the average of the French departments, and is about equal to the two English counties of Stafford and Derby. The population in 1831 was 989,938, in 1836 it was 1,026,407, showing an increase in five years of 36,469, or nearly 3·7 per cent., and giving above 466 inhabitants to a square mile. In amount and density of population it surpasses the average of the French departments almost in the proportion of three to one, and far exceeds every other department except the metropolitan department of the Seine, by which it is surpassed in both these respects. It is rather below our own county of Lancaster in the number of its inhabitants, and the population is scarcely half as dense as in the latter county. Lille, the capital of the department, is in 50° 37′ N. lat. and

3° 4′ E. long., 125 miles in a direct line east by north of Paris, or 140 miles by the road through Peronne, Cambray, and Douay, or by that through Amiens and Arras.

The coast of this department extends from Gravelines, at the mouth of the Aa, 19 or 20 miles in a tolerably straight line east by north to the boundary of France and Belgium. It is skirted by broad sands, which stretch out a mile or a mile and a half from the shore, and by a second line of sands lying a short distance off the coast, which form the seaward shelter of the roads of Dunkerque. Dunkerque is the principal port in the department; the mouth of the Aa forms the port of Gravelines, which is however a place of little trade.

The department is generally flat. The hills which form the prolongation westward of the heights of Ardennes, and in which the Escaut and the Sambre have their source, skirt the southern boundary from Avesnes to Cambray; and a branch from these heights bounds on the west the valley of the Sambre, to between Bavay and Maubeuge. A line of low sand-hills or downs skirts the coast. The high ground about Cassel, between the valleys of the Lys and the Yser, is remarkable for the view which it commands: thirty-two towns can be counted, and a part of the ocean, fifteen miles distant, can be seen. This extensive prospect is however owing rather to the general flatness of the surrounding country than to any great elevation of the ground.

The western, or rather north-western side of the department, from the coast to Hazebrouck and Bailleul inland, is occupied by the supracretaceous formations. The country north of Lille is occupied by the same series. The rest of the department, with the exception of a small portion lying east of a line drawn through Bavay and Avesnes, which portion is occupied by the granite and slate rocks, is included in the great chalk district which encircles the Paris basin.

The mineral treasures of the department are considerable, though it affords little metallic ore except iron, which is obtained at Glajon, Trélon, Ohaim, and Féron, in the arrondissement of Avesnes, near the eastern extremity of the department, on the Belgian frontier. There are six or eight coal-pits in the Valenciennes coal-field, which is a prolongation of the great coal-field of Belgium. Altogether, in 1834, 4233 men were employed in the mines, and 1331 in the connected works; the chief pits are at Anzain or Anzin near Valenciennes. [ANZIN.] The quantity of coal raised in the department in 1834 was 527,033 English tons, and in 1835, 531,605 tons; a quantity far exceeding that raised in any other department except that of Loire. The coal is used in the departments of Nord and Pas de Calais, and at Paris; its transport is facilitated by the Escaut, the Scarpe, the canal of St. Quentin, and the rivers Oise and Seine. (*Parliamentary Papers; Statistical View of Mining Industry in France*, presented by G. R. Porter, Esq., to the British Association for the Advancement of Science.) Steam-engines are used for draining the mines. There are considerable beds of peat, and there are beds of fossil ashes that are used for manure. Marble and sandstone suitable for paving are quarried on a large scale; and potters' earth is dug as well as brick earth. There were in 1834 seventeen establishments for making iron.

The principal rivers are the Aa, the Yser, the Escaut, and the Sambre, with their respective tributaries. The Aa has no part of its course within the department; it skirts the south-western border for about 16 or 17 miles, through the whole of which distance it has been made navigable. The Yser rises just within the department of Pas de Calais, and crosses the department of Nord, in a north-east direction, into Belgium, after entering which it becomes navigable, and flows into the North Sea at Nieuport. The Yser receives the Peene, a small stream, near the town of Wormhout. The Lys, after skirting the southern border near the town of St. Venant (Pas de Calais), enters the department, which it crosses in a north-east direction, sometimes within the boundary, sometimes upon it, until it finally quits it to enter Belgium, in which, after a course of many miles, it joins the Escaut. That part of its course which is connected with this department may be estimated at about 35 miles, for the whole of which it has been rendered navigable. It receives on the right bank the Clarence, the Lawe, and the Deule. The Lawe is navigable, and the Deule is incorporated in the line of the navigation from the Scarpe to the Lys. The Deule receives the Marque.

The Scarpe rises in the department of Pas de Calais, enters this department above Douay, and crosses it in a north-east direction to the border of Belgium, on which border it joins the Escaut. Its course in this department is about 26 or 27 miles. It has been made navigable in the upper and the lower part of its course, and these two portions are connected by a line of canal navigation nearly parallel to the river.

The Escaut rises in the department of Aisne, and enters that of Nord a short distance from its source. It runs, in a winding course of 16 miles, northward to Cambray, where it becomes navigable, and then runs 18 miles north-east past Bouchain and Valenciennes to Condé; at Condé it turns north-west, and runs 7 miles to the junction of the Scarpe, after which it enters Belgium. Above the point where the navigation commences, the canal of St. Quentin follows the course of the stream, and unites with the navigation at Cambray. The Escaut receives the Sensée on the left bank at Bouchain, the Selles and the Ecaillon on the right bank, between Bouchain and Valenciennes, and the Haine on the right bank at Condé. The Honelle falls into the Haine, and the Hougneau into the Honelle. None of these tributaries are navigable.

The Sambre rises in the department of Aisne, and entering this department a few miles from its source, runs 30 miles north-east past Landrecies (where the navigation commences) and Maubeuge into Belgium. It receives on the right bank the Grande Helpe and the Petite Helpe, neither of which is navigable.

The department has a number of canals. The canal of Bourbourg commences in the Aa, a little above Gravelines, and runs parallel to the coast past the town of Bourbourg as far as Dunkerque. The canal from Dunkerque to Furnes continues the line of navigation into Belgium. Another line from the Aa to Furnes is formed by the canal of La Haute Colme, which extends from Watten on the Aa to Bergues, and the canal of La Basse Colme, which extends from Bergues to Furnes. These two lines of canal are connected by a short canal from Dunkerque to Bergues.

The canal of La Nieppe commences in the navigation of the Lys, near Aire, and runs east by north until it is joined by a small canal from Hazebrouck; the communication is continued by the canal of La Bourre into the navigation of the Lys, between St. Venant (Pas de Calais) and Estaires. A canal of considerable length passes by Roubaix.

The canal of the Deule, the most extensive in this part of France, commences in the Lys, between Armentières and Warneton, and passes by Lille and Haubourdin to the Scarpe at Douay; its whole length is about 40 miles, part of which is in the department of Pas de Calais. It is divided into the Basse or Lower Deule, between the Lys and Lille, and the Haute or Upper Deule, between Lille and Douay. It receives a canal, cut from the Lys at or below Aire, and carried past La Bassée, from which it takes its name, 'the Canal of La Bassée.' Only a small portion of this canal is in the department of Nord.

The canals of Raches and Le Decours connect the two navigable portions of the Scarpe. The canal of the Sensée follows the line of the river Sensée from the Scarpe near Douay to the Escaut near Bouchain.

The canal of St. Quentin, part of the line which connects the Somme and the Oise with the Escaut, enters the department on the south side, and following the course of the Escaut, opens into that river at Cambray. The canal of Condé commences in the Escaut at Condé, and runs eastward along the valley of the Haine to Mons in Belgium. The canal from the Sambre to the Oise has part of its course in this department.

The length of the navigation, both of the rivers and the canals, in this department, is thus given in the official statements published by the government (*Statistique de la France*):—

Rivers.	Miles.
Aa	19
Lys	34
Lawe	1
Scarpe	33
Escaut	38
Sambre	35
River navigation	160

Canals.	Miles.
Canal of Bourbourg	13
„ from Dunkerque to Furnes	9
„ of La Haute Colme	15
„ of La Basse Colme	9
„ from Dunkerque to Bergues	5
„ of La Nieppe	6
„ of Hazebrouck	4
„ of La Bourre	5
„ of Roubaix	14
„ of La Deule	30
„ of La Bassée	1
„ of La Sensée	17
„ of St. Quentin	16
„ of Condé	4
„ from the Sambre to the Oise	7
„ of Préavén	1
Canal navigation	156

The number of Routes Royales, or government roads, is fifteen: their aggregate length is nearly 363 miles, of which 4 or 5 miles are unfinished, 34 out of repair, and 325 in good repair. The principal roads are those from Paris by Cambray and Douay to Lille, and thence to Ostend; from Paris by Amiens and St. Pôl to Hazebrouck and Dunkerque; and from Paris by Laon to Avesnes, and thence to Mons and Brussels. There are other roads from Paris to Lille; one through Amiens and Arras, and another through Amiens, St. Pôl, and Bethune. A second road from Paris to Dunkerque runs along the coast through Calais and Gravelines. A road from Paris to Valenciennes branches from the road to Avesnes and Brussels at Marle, and runs by Landrecies and Le Quesnoy. A road runs from Lille to Bailleul and Cassel, and thence to Dunkerque; and another to Tournay and Brussels in Belgium. Roads run from Douay to Lens and Arras (Pas de Calais) and to Bouchain; from Cambray to Valenciennes, to Amiens (Somme), Arras (Pas de Calais), and Mézières (Ardennes); from Valenciennes to Tournay and Mons in Belgium; and from Dunkerque and Bergues to Ypres, Menin, Courtray, and Gand, all in Belgium. Of the Routes Départementales, 150 miles were in repair and 27 miles unfinished on January 1, 1837. The bye-roads and pathways had at the same period an aggregate length of about 6300 miles.

This abundance of the means of communication is at once the indication and support of the manufacturing industry of the department. Several of the canals have been made since the general peace of 1815. The greater part of them are less than 5 feet deep. The canals and rivers had, when M. Dupin published his 'Forces Productives de la France' (1827), 66 locks or sluices. In the length of navigation the department exceeds the average of the departments in the proportion of between 4 and 5 to 1; and in the length of the government roads, in the proportion of about 5 to 3. If the comparatively smaller area of the department be taken into the account, the superiority will appear yet greater.

The agriculture of the department is far above that of the rest of France. The soil does not possess any superior excellence, and it has been necessary in many places to overcome by art the difficulty which it presented; in some parts it is marshy, as in the neighbourhood of Dunkerque, where draining has been very successfully practised; in other parts it is occupied by peat mosses; in others it is sandy or clayey: a considerable portion however is a rich loam. Of the whole surface of the department, which may be estimated in round numbers at 1,365,000 acres, nearly two-thirds (890,000 acres) are under the plough. The principal grain crops are wheat and oats, the produce of both of which exceeds, in the proportion of about three to one, the average of the French departments. Rye and maslin (or mixed corn) are also cultivated very extensively: the produce here is double that of the average of the departments, and the preponderance in barley and potatoes is as great.

The crowded population renders however this great productiveness insufficient for the supply of the inhabitants: corn is brought from the neighbouring departments of Aisne, Somme, Ardennes, Meuse, and others. A good deal of the barley is used for malting; as, from the department producing no wine, beer is the common beverage. A considerable quantity of gin or other corn spirit is distilled. The rotation of crops is regulated with considerable skill, and in some cases two crops are obtained in the year. Night-soil and lime are principally employed for manure. Gypsum would be used but for the heavy cost of conveyance from Paris, where the nearest quarries are situated.

The grass-lands are extensive, nearly 240,000 acres being thus occupied, chiefly in the eastern and western parts of the department. The artificial grasses are cultivated in great perfection; the trefoil is especially fine, producing a large seed, and yielding an unusual quantity of oil. Lucerne, sainfoin, peas, beans, turnips, carrots, beet-root, and cabbages of different kinds are also cultivated. The oleaginous grains, cole-seed, linseed, hemp and poppy seed, are extensively cultivated, and there are numerous oil-mills throughout the department. There were, in 1827, about 200 windmills for the expression of oil in the neighbourhood of Lille alone: in the whole department there were nearly 500 windmills and above 30 water-mills used for the same purpose. Of late years steam-mills have been employed.

Hops and tobacco are objects of great attention: the growth of the latter has suffered much from the restrictions laid upon it. About 40,000 acres of ground are occupied by orchards and gardens. Apples, pears, and nuts are grown; and the cultivation of flowers is attended to as much as in Holland.

The number of horses is very considerable, and exceeds the average of the French departments in the proportion of three to one. They are large and strong, and the breeding of them is an important object with the farmers of several districts. The number of cows and heifers is also very great; they are excellent milkers, and the dairies of the department produce much butter and cheese, the former of excellent quality. Bulls and oxen are by no means numerous; they are not so commonly employed in agricultural labour as in many other parts.

The growth of wool is considerable, being nearly double the average produce of the French departments. The sheep are chiefly of native breeds, and produce a long and tolerably fine fleece. Pigs are common. Poultry and water-fowl are abundant. Bees are kept chiefly in the south of the department. The rivers and canals furnish abundance of fish, and the coast-fishery, especially of herrings, is considerable. The woodlands are altogether insufficient for the supply of the department. Timber-trees are grown along the roads and in the hedgerows or other fences. Coal is generally used as fuel; it is procured partly from the coal-pits of the department, and partly from Belgium.

The superior agriculture of this district is ascribed by M. Dupin to the early emancipation of the peasantry from the feudal subjection and its attendant oppressions, to which the peasantry of other parts were subjected. The dukes of Bourgogne, sovereigns of the Low Countries, to which a considerable part of this department appertained, were in general enlightened and generous princes. The country possessed its 'states,' by which taxation was regulated and municipalities were established and encouraged. The effect of these immunities is even yet perceptible in the difference that exists in the social state of the arrondissements of Lille and Douay, which were under the Burgundian sway, and those of Cambray and Avesnes. The former are distinguished by small compact farms (for the peasantry are mostly occupiers if not owners of land), few fallows, and abundant and varied crops: in the latter, farms are larger, fallows more frequent, crops less varied and less abundant. The peasantry of the former are a quiet steady people, obedient to the laws, little given to change, and distinguished by their moral deportment. Few suffer from abject poverty, except the aged and the sick. They usually combine something of manufacture with their agricultural pursuits; and the spare time of the farmer and his wife and children is employed in spinning, linen-weaving, flax-dressing, lace-making, or the manufacture of tobacco.

The department is divided into seven arrondissements, as follows:—

Name.	Situation.	Sq. Miles.	Pop. 1831.	Pop. 1836.	Communes.
Lille	Central	338	294,541	309,349	131
Douay	Central	183	92,750	94,573	67
Dunkerque	W.	279	95,571	96,858	60
Hazebrouck	Central	268	104,007	105,879	53
Avesnes	E.	541	127,353	132,325	152
Cambray	S.	346	152,444	157,362	117
Valenciennes	Central	244	123,272	130,061	80
		2199	989,938	1,026,407	660

The number of cantons, or districts under a justice of the peace, is sixty.

In the arrondissement of Lille are—Lille (pop. in 1826, 69,860; in 1831, 69,073; and in 1836, 72,005), and Haubourdin, on the canal of the Deule; La Bassée, on the canal of La Bassée; Armentières (pop. in 1831, 5943 for the town, 6338 for the whole commune); Warneton and Comines, on the Lys; Tourcoing (pop. 8094 town, 17,973 commune); Roubaix (pop. 12,443 town, 18,187 commune); Lannoy, and Séclin, near Lille. Of some of these an account is given elsewhere. [ARMENTIERES; LILLE; ROUBAIX; TOURCOING.] Haubourdin is a small place, with a population of 1900 in the town itself, or 2151 in the whole commune. La Bassée was formerly a fortress of considerable strength, but is now an open town. The inhabitants (who amounted in 1831 to 2480) carry on considerable trade in corn, cattle, and linen. Peat is dug in the neighbourhood. Comines, on the banks of the Lys, is partly in France and partly in Belgium. The townsmen of the French part (pop. 2966 town, 5316 commune) manufacture tape. Philippe de Comines, one of the best historians of the middle ages, was born here. Séclin had, in 1831, a population of 2258 for the town and 2829 for the whole commune. The villages of Los or Loos, and Wazemmes, close to Lille, are busy manufacturing places; the first has a large house of correction, in which are 1500 prisoners; the second has a population of 8000 or 9000.

In the arrondissements of Douay and Valenciennes are—Douay (pop. in 1831, 18,793; in 1836, 19,173), St. Amand (pop. 4850 town, 8734 whole commune), and Marchiennes, on the Scarpe; Orchies, in the country north-west of the Scarpe; Valenciennes (pop. in 1831, 18,953; in 1836, 19,499), Bouchain, and Condé (pop. 3498 in the town, 5350 in the whole commune), on the Escaut; Arleux and Lecluse on the Sensée, and Haspres on the Selles. The more important of these places are described elsewhere. [AMAND, ST.; BOUCHAIN; CONDE; DOUAY; VALENCIENNES.] Marchiennes had in 1831 a population of 2355 in the town, or 2505 in the whole commune. The townsmen are much engaged in the cultivation of fruit-trees and asparagus. Orchies is a busy town, with 2195 inhabitants in the town, or 3425 in the whole commune. They are engaged in brewing, distilling, tanning, seed-crushing, and the manufacture of soap, hats, and pottery. Haspres had, in 1831, 2720 inhabitants. The village of Anzain or Anzin, near Valenciennes, has important coal-works. [ANZIN.] Famars was the site of a Roman post, 'Fanum Martis,' of which the remains are discernible on a hill.

In the arrondissement of Dunkerque are—Dunkerque (pop. in 1826, 24,517; in 1831, 24,937; and in 1836, 23,808), on the sea; Gravelines (pop. 4193) and Watten, on the Aa; Bourbourg, on the canal of Bourbourg; Bergues (pop. 5962) and Hondtschoote, near Dunkerque; Ekelsbeke, on the Yser; and Wormhout, on the Peene. [BERGUES; DUNKERQUE; GRAVELINES.] Bourbourg (pop. 2378) was antiently a place of strength, but its fortifications were demolished after the peace of the Pyrenees. Some trade in corn is carried on. Wormhout is a post-town, with a population of more than 4000.

In the arrondissement of Hazebrouck are—Hazebrouck (pop. in 1826, 7644; in 1831, 7522, of whom 4748 were in the town; and in 1836, 7674) and Cassel (pop. 2974 town, 4234 commune), on the road from Paris to Dunkerque; Steenvoorde, near Cassel & Bailleul (pop. 6015 town, 9823 commune), near the Belgian frontier; Merville, Estaires, and La Gorgue or Gorgne, on or near the canal of Bourre. BAILLEUL, CASSEL, and HAZEBROUCK are described elsewhere. Steenvoorde had in 1831 a population of 1789 in the town, or 4022 in the commune; the inhabitants tan leather and manufacture woollen and linen yarn. At Merville (pop. 5864 town, 5943 commune) and Estaires (pop. 2969 town, 6504 whole commune) table-cloths and other linens are manufactured. Estaires is probably on the site of Minariacum, a town mentioned in the 'Itinerary' of Antoninus; the townsmen of La Gorgues or Gorgnes (pop. 3225) are engaged in the same manufacture.

In the arrondissement of Avesnes are—Avesnes (pop. in 1826, 3311; in 1831, 3166; in 1836, 3030) and Liessies, on the Grande Helpe; Landrecies, Berlaimont, Pont-sur-Sambre, and Maubeuge, on the Sambre; Le Quesnoy, near the Ecaillon; Bavay, near the Hougneau; and Solre le Château, near the Belgian frontier. [AVESNES.] Landrecies is in the midst of meadows: it is a place of strength, and has stood several sieges. The inhabitants (pop. 3726) carry on trade in cattle and cheese. The navigation of the Sambre commences here. Berlaimont had a population in 1831 of 1914 town, 2068 whole commune. Maubeuge (pop. 6240) is a fortified town. It was conquered by Louis XIV., who retained it by the treaty of Nimeguen. The inhabitants are chiefly engaged in the manufacture of iron goods and nails, and there is a government manufactory of fire-arms. There are coal-pits and slate and marble quarries in the neighbourhood. Le Quesnoy (pop. 3191) has a handsome town-hall. Its barracks will hold 5000 men. Louis XIV. founded an extensive military hospital here. Bavay (pop. 1635) was Bagacum, the chief town of the Nervii. Under the Roman dominion it was a town of importance, being at the convergence of several roads, and was adorned by a circus, an aqueduct, and other buildings. Solre-le-Château (pop. 2103 town, 2477 commune) manufactures lace and leather, and trades in wool and flax.

In the arrondissement of Cambray are—Cambray (pop. in 1826, 17,031; in 1831, 14,510 for the town, or 17,646 for the commune; and in 1836, 17,846) and Honnecourt, on the Escaut; Le Cateau or Château Cambresis (pop. 5814 town, 5946 commune), on the Selles; and Solesmes, between the Selles and the Ecaillon. [CAMBRAY; CATEAU, LE.] The inhabitants of Solesmes manufacture soap, starch, and leather.

The population, where not otherwise specified, is that of the whole commune, and according to the census of 1831.

The manufactures of this department are varied and important. Wool-combing, the spinning of linen, cotton, and woollen yarn, and the manufacture of bleached and unbleached linens of various degrees of fineness, of printed and other cottons, of handkerchiefs, cotton velvet, bed-ticking, table-cloths, and woollen cloths, are carried on with great activity. Various pigments, soft-soap, drawing-pencils, toys, and turnery are manufactured. Distilleries of corn spirit, refining-houses for sugar and salt, breweries, dye-houses and bleach-grounds, iron-works, glass-houses for bottle and window glass, paper-mills, brick-yards, rope-walks, tan-yards, curriers'-shops, saw-yards for marble, &c., are numerous. The manufacture of beet-root sugar is also extensively carried on, and there are government establishments for casting cannon, making small-arms, refining saltpetre, and manufacturing snuff.

The department constitutes the diocese of Cambray or Cambrai, the bishop of which is a suffragan of the archbishop of Paris. It is in the jurisdiction of the Cour Royale of Douay, and in the circuit of the Académie Universitaire of that city. It is in the sixteenth military division, the head-quarters of which are at Lille. It has the fortresses of Gravelines, Dunkerque, Lille, Douay, Cambray, Valenciennes, Condé, Maubeuge, and Avesnes. It returns twelve members to the Chamber of Deputies.

In respect of instruction it is above the average of the French departments, but is by no means equal to those of the east part of France. The number of young men enrolled in the military census of 1828-9 who could read and write was 46 in every 100, the average of France being under 40. The department however holds a high rank in the scale of intellectual culture among the educated classes: it is pre-eminent for the number of its learned societies. Lille has a Royal Society of Science; Douay, a Royal and Central Society of Agriculture, Science, and Art, a Society of the Friends of Industry, a Society of the Friends of the Arts, and a Society of Medicine, Surgery, and Pharmacy; and Cambray has a Society of Emulation. There were in 1829, a Collège Royale, with about 300 students; 15 communal high schools, with about 1500 students; 4 private schools, with more than 200 scholars; 21 boarding-schools for boys, with above 600 scholars; and fifty-three girls' boarding-schools, with about 3000 scholars. There were also 14 schools under the direction of the Frères de la Doctrine, with about 3200 scholars; 12 schools of mutual instruction, with 1200 scholars; and 1117 primary schools, with 62,000 scholars: making a total of 1237 institutions of all kinds for educational purposes; with upwards of 72,000 persons under instruction.

The press is very active: fifteen newspapers or other periodicals are published in the department, viz. four at Lille, three at Dunkerque, two each at Douay, Cambray, and Valenciennes, one at Hazebrouck, and one at Avesnes; besides which 250 works on morals, sciences, and literature are published on the average yearly

There are in the department 46 almshouses or hospitals, with yearly revenues or receipts amounting to 1,350,000 francs, or 54,000*l.*, which provide for 900 sick persons, 2800 old people, and 1400 orphans. A sum of 273,000 francs, or about 11,000*l.*, is set apart yearly from the revenue of the department for the maintenance of about 3500 foundlings, and the communes set apart nearly 1,000,000 francs, or 40,000*l.*, to support above 600 *bureaux de bienfaisance*, or 'charity houses,' which afford relief to 150,000 persons. It may be observed however that the large proportion of persons receiving alms or relief (nearly 160,000, or almost 1 in 6 of the whole population) furnishes a considerable drawback to the pictures which our authorities draw of the prosperity of the department

The department was antiently included in the territory of the Morini, the Atrebates, and the Nervii, all Belgian nations. The Morini dwelt between the Lys and the sea; the Atrebates between the Lys and the Escaut; and the Nervii east and north of the Atrebates. In the Roman division of the Gallic provinces these nations were all included in Belgica Secunda. There were several Gallic or Roman towns within the limits of the department, some of them of importance. Castellum Morinorum, 'the fortress of the Morini,' noticed in the 'Itinerary' of Antoninus, was on the site of the modern Cassel; and Minariacum, another town of the same people, on that of the modern Estaires. Origiacum, a town of the Atrebates, mentioned by Ptolemy, was probably the modern Orchies; and Camaracum and Bagacum, two important towns, the latter the chief town of the Nervii, may be recognised in the modern Cambray and Bavay. The Hermonacum of the Theodosian Table, was probably near Le Quesnoy; the Fanum Martis of the 'Notitia' may be recognised in the modern Famars; and the Pons Scaldis of Antoninus was between the modern Valenciennes and Condé. The Locus Quartensis of the 'Notitia,' may be recognised in the modern Quarte, a village on the bank of the Sambre; and the Duronum of Antoninus and the Theodosian Table was at or near a place called Estrun-Cauchie, on the Petite Helpe, near Avesnes.

On the downfall of the Roman empire, the Franks possessed themselves of this part of France, and it is probable that a considerable portion of the department was comprehended in the hereditary dominions of Clovis and his early ally Ragnacaire. During the prevalence of the feudal system one part was comprehended in the county of Flanders, another in that of Hainaut (both established in the ninth century), and another part in Le Cambresis, or territory of Cambray. These counties of Flanders and Hainaut, having come into the hands of the dukes of Burgogne, passed with other portions of their inheritance to the Spanish branch of the House of Austria, which also acquired possession of Le Cambresis. The districts included in this department were conquered by Louis XIV., and formed by him into the military government or province of La Flandre Française, or French Flanders, having Lille for its capital. This country was the scene of the later campaigns of the Duke of Marlborough and Prince Eugene, who took Lille (A.D. 1708), Douay (A.D. 1710), and Bouchain (A.D. 1711), after forcing the lines which the French had constructed to cover the frontier. After the secession of the English from active participation in hostilities (A.D. 1712), Prince Eugene with the other allies took Le Quesnoy and besieged Landrecies; but Marshal Villars, the French general, having gained a victory at Denain near Valenciennes, and taken Marchiennes, obliged Eugene to raise the siege. Villars then retook Douay, Le Quesnoy, and Bouchain; hostilities were however soon brought to an end. In the campaigns of 1793 the department was again the seat of war; the camp of Famars was stormed; Valenciennes, Condé, and Le Quesnoy were taken by the allies; and Dunkerque, Cambray, and Bouchain were besieged or menaced, but in vain. In the campaign of 1794 the allies besieged and took Landrecies, and threatened Cambray, Douay, and Bouchain. Pichegru and Jourdan however, advancing from Lille and Maubeuge, defeated them in several encounters, and retook Condé, Valenciennes, Landrecies, and Le Quesnoy without resistance. In 1815 Louis XVIII., flying before Napoleon, made a short stay at Lille, and in the subsequent advance of the allies into France, they crossed this department, the English passing through Bavay. Cambray was taken by escalade, and Le Quesnoy by capitulation.

NORDBERG, GEORGE, born at Stockholm in 1677, studied at Upsala, took holy orders, and in 1703 was appointed almoner to the Swedish army under Charles XII., then at Thorn in Prussia. He followed Charles XII. into Poland, Saxony, and Russia, and in 1807 was made chaplain to the king. Being made prisoner by the Russians at Pultawa in 1709, he was sent into Russia together with Count Piper, but was exchanged in 1815, when he again joined Charles XII. at Lund in Scania. Not long after however Nordberg was appointed incumbent of the parish of St. Clair and Olaüs, at Stockholm, where he spent the remainder of his life. After the death of Charles XII. he was commissioned by Queen Ulrica Eleonora to write his history under her own inspection, and the MS. was afterwards submitted to the revision of a royal commission. The work was published at Stockholm in 1740, 2 vols. fol., and translated from the Swedish into French, and published at the Hague, 'Histoire de Charles XII., par M. de Nordberg 3 vols. 4to., 1742. The documents from which Nordberg compiled his history are authentic, and he had himself witnessed many of the facts which he relates, and which he had noted down in his journal. His work is therefore a book of authority. The style however is heavy and diffuse. Nordberg speaks slightingly of Voltaire's 'History of Charles XII.,' which is written in a more amusing style, but is inferior to the work of Nordberg in point of correctness. Nordberg died at Stockholm, in 1744.

NORDEN, FREDERIC LOUIS, born at Glückstadt in Holstein, in 1708, was educated for the navy, and entered the naval school of cadets at Copenhagen. He made great progress in mathematics, and became a very expert draughtsman. In 1732 he obtained the rank of lieutenant in the Danish navy; and soon after, King Christian VI., having been made acquainted with his ability in drawing, gave him permission to travel abroad for his improvement, and allowed him a pension for the purpose. Norden went to Italy, where he spent about three years, after which he was commissioned by the king to proceed to Egypt for the purpose of examining the antient monuments of that country. He arrived in Egypt in July, 1737; and having visited Alexandria and Cairo, he proceeded up the Nile as far as Derr in Nubia, after which he retraced his steps towards Alexandria, where he reimbarked for Europe, in May, 1738. On his return to Copenhagen he was well received by the king, and was made captain in the navy. In 1740 he proceeded to England to offer his services as a volunteer in the war against Spain. He sailed with an English squadron for South America, and returned to England in the autumn of 1741. On being made a member of the Royal Society of London he published in English a memoir on the colossal statues and other remains of antiquity at Thebes. He died at Paris, in September, 1742. His papers and drawings concerning Egypt were arranged by his friends and published in French, 'Voyage d'Egypte et de Nubie,' 2 vols. fol., Copenhagen, 1752-5. The first volume consists entirely of plates, being a series of maps of the course of the Nile from Cairo to Derr, and a succession of views of the scenery along the banks of the river, forming a kind of panorama of the Nile; besides plans and sections of the pyramids, temples, and other remarkable buildings. The second volume contains Norden's journal, which is written in a plain unpretending style. The editors have added a biographical notice of the author. Norden was the first traveller who explored Egypt as an artist, and his drawings gave the first tolerably correct idea of the stupendous monuments of that country. His work was translated into English, and published in London, in 2 vols. fol. Langlès published a new edition of the original French, in 3 vols. 4to., Paris, 1795-8, with corrections.

NORDHAUSEN, a Prussian town in the government of Erfurt, in the province of Saxony, is in 51° 30′ N. lat. and 10° 50′ E. long., on the south side of the Harz mountains, on the little river Zerze, and at the beginning of the celebrated tract called the Gulden Au, that is, the golden valley. It is an old-fashioned place, surrounded with walls and towers, and has seven gates. From the year 1220 till 1802, when it was united to the Prussian dominions, it was a free imperial city. It is built partly in the plain and partly on the declivity of a hill, and consists of the upper and lower towns. There are seven Lutheran churches, a gymnasium, some very well conducted girls' schools, an orphan asylum, three hospitals, and other useful institutions.

The inhabitants, 11,000 in number, manufacture very great quantities of woollen cloths, flannels, and lackered ware; they likewise make vitriol, aquafortis, and cream of tartar: the breweries are very extensive, and the distilleries produce annually 30,000 casks of brandy, and consume 300,000 bushels of corn. The oil-mills produce annually (according to Cannabich) 70,000 cwt. of rape oil and 2,600,000 oil-cakes. The tanneries are likewise important. The inhabitants derive great profits by fattening oxen and swine, most of which (6000 oxen and 30,000 swine) are exported. Besides the profitable export trade in the above articles, the trade in corn is very great, so that on the whole Nordhausen is a flourishing town. It is said that a tribe of gypsies are still living nearly in a savage state in the village of Friedrichslohra near Nordhausen. (Forsteman's *Urkundliche Geschichte der Stadt Nordhausen;* Müller's *Handbuch,* 4 vols. 8vo., 1836. This latter is a topographical dictionary of the Prussian dominion, which is always used in this work as authority for places in Prussia, being a book of official character.)

NORDLAND. [TRONDHIEM.]

NORDLINGEN. [SCHLESWIG.]

NORDSTRAND. [SCHLESWIG.]

NORE. [THAMES.]

NORFOLK, a maritime county of England, on the eastern coast. It is bounded on the south-east and south by Suffolk, from which it is separated in one part by the river Waveney, and in another part by the Little Ouse; on the south-west and west it is bounded by Cambridgeshire, and for a short distance on the west by Lincolnshire; on the north-west it is bounded by the Wash, which separates it from Lincolnshire; and on all other sides by the North Sea or German Ocean. Its form approximates to an oval, having its greatest length, from east by south to west by north, from Yarmouth to the neighbourhood of Wisbeach in Cambridgeshire, 67 miles, and the greatest breadth, from the neighbourhood of Thetford to the village of Blakeney, 42 or 43 miles. The area is estimated at 2024 square miles: the population in 1821 was 344,368; in 1831, 390,054, showing an increase in ten years of 45,686, or 13 per cent., and giving 193 inhabitants to a square mile. In area it is the fourth of English counties, being exceeded only by Yorkshire, Lincolnshire, and Devonshire; in amount of population the ninth; and in density of population the twenty-sixth. Norwich, the capital, is on the river Wensum, about 97 miles in a direct line north-east of London; 118 miles by the mail-road through Bishop's Stortford, Newmarket, Bury, Thetford, and Attleburgh, or 113 miles by the other mail-road through Chelmsford, Colchester, and Ipswich.

Coast-line, Harbours, &c.—The Norfolk coast commences at the æstuary of the Yare, and extends in a regular convex outline to the Wash. It is liable to continual encroachments from the sea, which, especially about Cromer, has gained much on it. It is for the most part low. Between Happisburgh (which is near North Walsham) and Weybourne, a village west of Cromer, are cliffs called the 'Mud Cliffs,' formed of diluvial matter, especially clay, with large masses of imbedded chalk. These cliffs rise in one part to the height of 50 or 60 feet (Mr. R. Taylor, in *Philos. Mag.* for 1824), but are generally much lower. Between the mouth of the Yare and the commencement of the cliffs is a low sandy coast skirted by sand-banks. The channel between these banks and the shore is known as Yarmouth Roads, and constitutes a safe anchorage, in some places of 10, 12, or 13 fathoms. In time of war, this roadstead is the usual rendezvous of the North Sea fleet; and at all times is frequented by the northern colliers in their way southward. West of the cliffs a low sandy or shingly coast succeeds, extending to St. Edmund's Point, at the entrance of the Wash. Along this coast are a line of sand-hills, or as they are locally termed 'meals,' or 'marum hills,' from the marum or marram (*arundo arenaria*) which grows on them. Some of these 'meals' are insulated at high-water. The sands by which Brancaster Bay in this part of the coast, is defended to seaward, render it tolerably safe anchorage, with a depth in some parts of 16 or 18 fathoms. At Hunstanton, near St. Edmund's Point, are cliffs nearly 80 feet high. The Wash is an æstuary, having extensive sand-banks dry at low-water, with channels of deeper water between them. The Ouse and the Nene both flow into it. The deeper water off the Norfolk coast is known as Lynn Well or Lynn Deeps. The coast on the Norfolk side of the Wash is low and marshy. There are a number of creeks and harbours on the Norfolk coast:—Yarmouth, Cley and Blakeney, Wells, Burnham, Brancaster, Thornham, Heacham, Snettisham, and Lynn.

Surface and Geological Character.—Norfolk contains no hills. The rivers flow through valleys of varying breadth, skirted by low rising grounds or uplands. The highest ground in the county is probably on the north-west side, where the chalk downs appear, extending north and south from near St. Edmund's Point to Castle Acre, between Lynn and Swaffham, where they sink beneath the marshy valley of the Nar, from which they again emerge and extend to Downham. This high ground subsides gradually toward the east, where the chalk sinks under the beds of diluvium (or alluvium, for our authorities are not agreed) which overspread a large portion of this county and the adjacent county of Suffolk; but on the west, toward the shore of the Wash, the chalk has a steeper escarpment. On this side the chalk-marl and green-sand crop out from beneath it; and beds of similar character to those of the Weald in the south-east part of England crop out from beneath these formations. The western part of the county is included in the great Fen district. The chalk has been found in many places in the eastern part of the county, beneath the diluvial beds. Near Cromer large portions of it have been washed away by the sea, and the point of 'Foulness' near that town has evidently been the site of a farther extension of the chalk towards the north-east; and some of the shoals which render the navigation of this coast so dangerous are formed of aggregated masses of ponderous chalk flints. This chalk is in some places dug for lime; and at Marham, west of Swaffham, are extensive chalk-pits, the chalk from which is sufficiently hard and dense to be used for building. Among the most curious fossils of the chalk are the flints called by Professor Buckland 'Paramoudræ;' they are commonly about three feet long, pear-shaped, and are found with the smaller end downwards.

The diluvial beds vary in their character. In the eastern part they are of gravel, sand, and clay, embodying in many places fragments of chalk, and containing a substratum of fossil shells, several feet in thickness, called 'crag-pit shells.' Many of these shells approach in their specific characters to the existing species of the neighbouring shores, while others belong to extinct species. Beds of alluvial gravel are found on the sides of the valleys which intersect this district. At Norwich and to the north and west of the city thick beds of sand and gravel are found resting on the chalk, with patches of alluvial clay and brick-earth interspersed. In the western parts of the diluvial districts large blocks or boulders of grey or greenish sandstone, distinguished by its peculiar fossils, are found in pits of the clay or marl which rests upon the chalk. This side of the county is however chiefly distinguished by sandy beds. The Suffolk word 'crag,' meaning gravel, has been adopted into geological science, and applied to beds of hard sand and gravel with fragments of shells, or more generally to the diluvium of this and the adjoining counties.

Chalk is dug for lime in many places; excellent sand for glass-making is procured between Snettisham and Castle Rising; some potters'-earth is found and excellent brick-earth; marl is dug in the valley of the Bure; and the Fen districts of the west furnish peat for fuel and manure.

Hydrography; Probable Changes of the Coast in Past Centuries.—The principal streams flow from the north-west part of the county, where the chalk occupies the surface. The Wensum or Wensom rises at Oxwich, in the neighbourhood of Fakenham, and after making a circuit past that town, flows south-east in a winding channel 45 miles to Norwich, 2 miles below which it joins the Yare. The Yare rises at Shipdam, between Watton and East Dereham, and flows eastward to the junction of the Wensom 25 miles. The united stream, to which some give the name of Wensom, and others of Yare, flows first towards the south-east and then towards the north-east 20 miles, till it expands into a large sheet of water called Breydon Water, 4 miles long and in some parts a mile broad, at the south-western extremity of which it receives the Waveney, and at the north-eastern the Bure; after receiving which it bends and flows 3 miles southward into the German Ocean. From the source of the Wensum, the real head, to the outfal of the river, is 74 miles.

The Waveney rises at Lopham, between Thetford and Diss,

and flows first eastward and then north-eastward, past Diss, Harleston, Bungay, and Beccles, to its junction with the Yare, nearly 50 miles. The Bure rises in the northern part of the county, at Melton Constable, between Foulsham and Holt, and flows south-east past Aylsham 50 miles, to its junction with the Yare. These rivers receive several small tributary streams: the Taes joins the Yare near Norwich; and the Thurn, from the neighbourhood of North Walsham, joins the Bure.

In the lower part of their course, the Yare, Waveney, and Bure flow through flat marshy valleys, in which are considerable pools of water, locally designated 'broads' and 'meers.' The valley of the Bure, united with some adjacent vales, forms a wide tract of low land, interspersed with some insulated plots of higher ground called 'holms,' and containing a greater number of 'broads' than any other part of the county. Some of these are of considerable extent, as Filby Broad and Rollesby Broad, forming a winding sheet of water 3 miles long; Hickling Broad, 1½ miles long and as much broad, and others. One arm of the Thurn passes through this lowland tract to the sea near Winterton Ness.

The streams of the western side of the county belong chiefly to the system of the Ouse, which touches the border of the county near Littleport, a few miles below Ely, and flows northward 22 miles into the Wash below Lynn. The tide flows up to Denver near Downham, where it is arrested by sluices: it formerly flowed up much higher. This river is subject to a great swell or overflowing at the equinoxes, especially at the spring-tides of the autumnal equinox. It receives the Little Ouse, the Wissey, and the Nar. The Little Ouse rises at Lopham, in the same tract of swampy ground as the Waveney: it flows west to Thetford, where it receives the Thet from near Hingham, 22 miles long. It joins the Greater Ouse in the marshes near the border of the county. It is a slow stream, 35 miles long, and traverses a flat uninteresting country. The Wissey, or Stoke, is formed by the junction of two streams, which rise, the one between East Dereham and Swaffham, the other west of Hingham, and unite at Buckenham Tofts, north by west of Thetford. From their junction they flow westward past Stoke Ferry into the Ouse near Denver Sluice. The length of the Wissey from the source of either of its tributary streams is about 30 miles. The Nar, or Setchy, rises at Litcham, in the neighbourhood of East Dereham, and flows westward by Castle Acre, and then northward 22 miles into the Ouse above Lynn.

One of the arms of the Nene forms for several miles the boundary of the county; and the Welney, a stream communicating between the Ouse and the Nene, skirts the border just above its junction with the Nene.

Beside these rivers a number of smaller streams fall into the sea along the north coast.

Few parts of England exhibit marks of more remarkable changes than this county. The valleys of the Waveney, Yare, and Bure were originally longitudinal basins of chalk; and subsequently to the deposition of those diluvial beds of gravel and sand, which cover a large portion of this side of the island, were probably arms of the sea. It is contended by Mr. Robberds that beds of shells, most of them of existing species, found on the shores of the adjacent German Ocean, have been deposited on the side of the hills at a height usually of 40 feet, or thereabouts, above the lowest part of the present valleys, which beds are rarely found except on the face or slope of the uplands that skirt the valleys. 'All the circumstances connected with these beds of shells are strikingly and decidedly characteristic of a former strand or beach. An extended line of sand and pebbles, stretching at one uniform elevation along the side of a range of low hills, similar in its nature and appearance to that which universally skirts the ocean, and mixed with shells, some broken and some perfect, with drifted decayed vegetables (whether fuci or not), and with such substances as the retiring tide now leaves on every shore—this exhibits all the strongest features of a permanent boundary between land and water. . . Nor are these the vestiges of that antient ocean which, in ages unfathomably remote, covered the whole of this district. . . . As far as my observations have extended, I have never found them beyond the immediate skirts of this valley and its contiguous branches.' (*Geological and Historical Observations on the Eastern Valleys of Norfolk*, by J. W. Robberds, jun.) The period at which the ocean covered these valleys to the height mentioned is unascertainable; and the facts and deductions of Mr. Robberds as to the height of the waters of this ocean have been controverted. That the valleys were æstuaries seems indeed undeniable; and the bottoms of them, composed of a rich alluvial mud, intermixed sometimes with extensive beds of peat, are the deposits of a much later period than that to which Mr. Robberds's hypothesis refers. It seems probable that the valley of the Bure, as far as Burgh by Brampton, perhaps to above Aylsham, that of the Yare to above Norwich, and that of the Waveney at least to Bungay, were arms of the sea. The low flats north of Yarmouth, in which are so many 'broads,' and through which the Thurn proceeds to the sea, were also parts of an æstuary which probably remained till the time of Alfred, or even that of Edward the Confessor, but has since been left dry. There are local traditions of the sea having once reached Norwich on the Wensum, and Bungay Castle on the Waveney. Indeed the navigation of the Waveney is said to have extended to Lynn, which renders it probable that the whole valley of the Waveney and the Little Ouse was once an arm of the sea, like that which insulated Thanet [KENT], and that Norfolk was consequently an island or a group of islands. Local history, the names of places, the position and form of Burgh Castle (a Roman fort), and the discovery of anchors and other naval appurtenances in the marshes near Burgh, serve to confirm the supposition. We may suppose then that the eastern part of Norfolk was once a group of low islands. The hypothesis, once admitted, accounts for some passages in the history of our island not easily accounted for else. The spot on which Yarmouth stands was not dry land till the eleventh century.

The hundreds of East and West Flegg, in Norfolk, constituted probably one island; the hundred of Lothingland, in Suffolk, another; the 'holms,' in the valley and flats of the Bure, and Ellingham, in the valley of the Waveney, were smaller islands. The entrances of the intervening æstuary appear to have been at Horsea Gap, between Caistor and Happisburgh, at Yarmouth (where the opening extended, it is likely, from Caistor to Gorleston), and at Kirkley-road, near Lowestoft. (Robberds, *ut supra*.) An antient map, a copy of which is preserved by the corporation of Yarmouth, corroborates in a great degree the above supposition (Ives's *Remarks on the Garianonum of the Romans*); and Norwich in antient documents is described as a port.

Navigation and other Communications.—The Wensum and Yare are navigable to Norwich for sea-borne vessels. Norwich was accessible to ships of burden centuries ago, as antient records and historical incidents prove. The southern entrance of the Yare at that time, through what has since been called Lake Lothing, was much used by shipping; but a bar of shingle and sand accumulated at the mouth of it, and this was crowned (A.D. 1712) with an artificial bank to prevent the inundation of the marshes at high tides. The only navigable entrance to the Yare for centuries after the accumulation of the bar at Lake Lothing was by Yarmouth, where sea-borne vessels discharged their cargoes; and the communication with Norwich was carried on by river-craft. In 1827 an act was obtained for making the Yare and Wensum navigable for vessels drawing 10 feet water, and for making a cut from the Yare to the Waveney, and from the Waveney to the sea through Lake Lothing, thus restoring the antient entrance, and making Norwich once more a port. The tide or sea lock of this navigation will admit vessels 84 feet long and of 21 feet in the beam. These works have been completed. The Waveney is now navigable to Beccles for small sea-borne vessels; and to Bungay, a few miles higher up, for river-craft.

The Bure is navigable up to Aylsham, 40 miles from the sea at Yarmouth. The Ant, a feeder of the Bure, is navigable up to Wayford Bridge, and the navigation is continued by a canal up to North Walsham. The Thurn is marked in Priestley's 'Map of Inland Navigation' as navigable up to Hickling Broad.

The Greater Ouse and the Nene are navigable throughout that part of their course which is within this county. The communication between them, by means of the Wisbeach canal and the Well creek, is close on the border of the county. The Little Ouse is navigable up to Thetford; the Wissey, or Stoke, up to Stoke Ferry; and the Nar up to Castle Acre.

The Norwich mail-coach road through Ipswich enters the county at Scole on the Waveney, and runs by Long Stratton

to Norwich: that through Newmarket enters the county at Thetford, and runs by Attleburgh. The mail-coach road to Lynn and Wells enters the county about 9 miles beyond Ely, and runs by Downham, Lynn, Snettisham, and Burnham. Another road to Wells enters the county just beyond Brandon in Suffolk, and runs by Swaffham, Fakenham, and Great Walsingham. The road to Cromer branches off from this beyond Brandon, and runs by Watton, East Dereham, and Reepham. One road to Yarmouth branches off from the Norwich and Ipswich road at Scole, and follows the valley of the Waveney by Harleston, Bungay (Suffolk), and Hadisco: but the mail-coach road does not enter the county until it reaches Yarmouth.

The Eastern Counties Railroad is to run to Norwich nearly in the direction of the Ipswich and Norwich mail-road, and from thence is to be continued in an easterly direction to Yarmouth.

Agriculture.—Norfolk has long been considered as foremost among the English counties in an agricultural point of view. The same causes which have made the Netherlands productive, beyond the natural capacity of the soil, have brought about similar effects in Norfolk, where the improved systems of cultivation have been adopted by imitating the Flemings, with whom a direct intercourse has always been kept up from the eastern ports of England.

The climate of Norfolk is somewhat colder than that of the southern and western counties of England. The coast is exposed to the north-east winds, and the whole of the county is nearly a continued plain, with only slight undulations of the surface. Except in a small portion of the county on its western boundary, and a strip along the southern part, which are marshy, the air is dry and healthy. It is, on the whole, as favourable to the tillage of the land and the growth of corn as any part of England.

The soil may be divided into three classes: light sands of various qualities, chiefly in the north-western part of the county; low alluvial clays and loams, on the borders of Lincolnshire and Cambridgeshire; and loams of various qualities, chiefly light, incumbent on a marly clay, in the centre and eastern part. There is a strip of peat and marsh along the southern boundary, where the Ouse and the Waveney take their rise, and run with a very slow current, the one towards the west, where it discharges itself into the Wash, and the other eastward to the sea at Yarmouth. At Lophamford, where there was formerly a gate dividing Norfolk from Suffolk, the water runs to the right and left of the road: and from this point, which is low in appearance, the two rivers begin to flow. The fall from this point to the sea, on both sides, is very trifling, and the whole course lies in low peaty marshes.

The district in which the true Norfolk system of cultivation was first adopted, and where turnips and clover were introduced in the regular rotations, was that on the northwest, where the better kinds of sand prevail. From this district it has gradually spread; and there are now few soils in Norfolk which are considered too heavy to bear turnips, especially after having been well underdrained—a practice which evidently arose from the desire of raising turnips to feed cattle and sheep, and manure the land.

It is now more than a century since the system of cultivation which bears its name has been almost universally adopted in this county. It was the necessary consequence of the introduction of turnips in the place of the old fallow; and has only been modified by substituting artificial grasses, peas, or tares, for the clover, which was found not to succeed when too often repeated on the same land. In the regular course of turnips, barley, clover, and wheat, only one-fourth of the land is in wheat; but in very good loams, and where manure is abundant, it may safely be sown at a less interval than four years, by introducing peas or beans after the first rotation, and taking a crop of wheat after them. Thus the rotation becomes one of six years, viz. turnips, barley, clover, wheat, beans, wheat. There is another advantage in this, that the clover only recurs every sixth year, and its success is more certain. Where the soil is poorer and manure could not be produced in sufficient quantity to keep up the fertility, the artificial grasses may be allowed to remain two or three years for pasture, which recruits the land and saves manure. These circumstances will readily account for all the deviations from the original four years' rotation.

Norfolk was for many years far before other counties, north or south of it, in its agriculture; but for thirty or forty years little or no progress was made; and the Norfolk husbandry, introduced into the north of England and south of Scotland, advanced more rapidly than in the county where it originated. Turnips, having been originally introduced from Flanders and Holland, still continue to be sown broad-cast, as they are there. The raising them on ridges in rows, which is so much preferable, both in respect of the crop and the improvement of the soil, is only adopted by gentlemen and those farmers who have risen above the prejudices attached to a long established practice. Although the drilling and dibbling [Arable Land, vol. ii., p. 226] of wheat have been almost universally adopted, the turnips are still growing irregularly at various distances, a circumstance which precludes the use of the plough in the intervals, and restricts the cultivation to that of the hoe. Hence Norfolk does not in general produce such heavy crops of turnips as similar soils in Northumberland or in Scotland.

The crop which is raised in the greatest perfection in Norfolk is barley. It may be considered as the most important portion of its agricultural produce; and where sheep have been folded on turnips and the surface is enriched by their dung and consolidated by their tread, a slight shallow ploughing makes a perfect preparation for the seed. The old practice in Norfolk was to work the land by ploughing it three or four times for barley after turnips and for wheat after clover, as may be seen by Arthur Young's 'Report' of that county. Young justly condemns this practice on a light porous soil. Since that time a better practice has been introduced, and much useless ploughing has been omitted. On the heavy loams repeated ploughing may be thought necessary; but to plough often early in spring, when the land has been wet for a considerable time, is less likely to pulverise a heavy soil, than to watch an opportunity and plough it at the right time, when the soil is friable and readily crumbles under the harrows. Heavy loams should only be repeatedly ploughed when the earth falls readily from the mould board, which it does when neither too wet nor too dry. Where great attention is paid both to the quality of the grain and the quantity produced, no clover is sown amongst the barley, but it is drilled and hoed like wheat. This however is the exception, the general rule being to sow clover, after a shower, as soon as the barley appears above ground, and to slightly roll the surface.

There are few counties where such an extent of poor unproductive land has not only been brought into cultivation, but made equally productive with those which are naturally fertile, as in Norfolk. This has been effected chiefly by laying considerable portions of the marly clay, found a little below the surface, on the poorer soil which was at the surface, and by an excellent system of draining the land where the subsoil is impervious to water. The drains are made in winter, when labour is cheap, in a very simple manner the inclination of the soil being ascertained, and the ditches deepened so as to carry off the superfluous water, main-drains are laid out to receive the water collected by the smaller branches. Thirty inches is, in general, thought a sufficient depth for a main-drain, which is only two or three inches wide at bottom. In this are laid bushes, heath, broken stones, or, which is best, draining tiles, according to the means of the proprietor or occupier, and the cost at which they can be obtained. Parallel drains from twenty inches to two feet deep are dug which meet the main-drain obliquely downwards at the distance of from fifteen to thirty feet from each other, according to the wetness of the land. By this means all the surface water, which is not held in the soil, and which is more than is required for the healthy vegetation of the crop, runs slowly into these drains, which lead it into the main-drain, and ultimately into the receiving ditch. Thus the land is kept in a sound dry state, and however impervious the subsoil, sheep may be folded upon it at all times. This draining is very different from the draining of spongy or marshy soils, and requires a different system from that which Elkington practised with so much success. Any man may lay out drains judiciously, where it is only required to give an outlet for the superfluous water which falls on the surface in a rainy climate. The only thing to be attended to, is to proportion the distance of the drains to the nature of the soil with respect to porosity, and to the quantity of rain which usually falls in autumn and winter. A light porous soil of some depth might be much injured by draining, however wet the climate; for if it is useful to take off superfluous water, so it is beneficial to retain it where it runs off too fast.

These are the immediate means by which the waste lands of Norfolk have been brought into a fertile state. But much is also due to the practice of granting long leases to wealthy tenants, in which practice Mr. Coke (now Lord Leicester) has led the way, and justly deserves the title of a benefactor to his country, while he has received his reward in the increase of his property and the affection of his tenants. A proprietor has not always the means, and frequently not the judgment required, to undertake expensive improvements; but a tenant with a lease for a term of years calculates, and lays out his money as a speculation. The benefit which he derives is justly his due, but, whatever be the result, the land is improved, and the landlord benefited in the end. Leases have invariably tended to the rapid improvement of all farms so let, when the means and character of the tenant were ascertained, and judicious clauses introduced, not to fetter the tenant, but to prevent his injuring himself as well as his landlord.

To give even an outline of the mode of cultivation usually followed by the Norfolk farmer would require considerable space. It is sufficient to observe that the principles are chiefly those of a careful garden cultivation, and that, to provide sufficient manure for the corn-crops, half the land is devoted to raise food for cattle. The soil is not stirred so deep as in many other districts, which is owing to the thin staple of it in most places. The Norfolk farmer, in general, prefers a few inches of good earth made rich with manure, to a greater depth of inferior earth. Much time and expense are also saved by slight ploughing, which is performed with a very light plough, turning over a furrow ten or twelve inches wide and seldom more than four inches deep. Thus an acre and a half are prepared for sowing in one day by a boy and two horses. This is particularly the case where turnips have been eaten by sheep folded on the land. The clover-ley and artificial grasses are likewise ploughed shallow for wheat, which is sometimes very advantageously dibbled in the sward when turned over completely; for the wheat tillers and throws up many stems, deriving its nourishment chiefly by the coronal roots. In particular seasons and situations it is often subject to mildew, which is not so much the case where the soil is cultivated to a greater depth.

The chief cultivation and manuring are given in the preparation for sowing turnips, which begin the rotation. The land is ploughed and harrowed repeatedly, the weeds being collected and burnt; and finally it is ploughed in stitches, as they are called in Norfolk, which are divisions consisting of five or ten double furrows, according as the soil is heavy or light. This is done to let the surface water run off by the deeper furrows between the stitches, and for the convenience of sowing or drilling the seed regularly. The turnips are hoed by hand, and the labourers are very expert in leaving them at regular distances. A second hoeing is generally sufficient to destroy the weeds, after which the turnip-leaves so cover the ground that, if any weeds appear again, they are kept under by the shade of the turnip-tops. The turnip-fly and black caterpillar are, as elsewhere, a great torment to the farmer, especially where turnips have been long regularly sown every fourth year on the same land. Various devices have been resorted to in order to prevent the depredations of these insects, but none have had complete success. A muslin net like a bag has been drawn over the land as the turnip-plants are coming out of the ground, and thousands of flies have been caught; but they seem to be produced more rapidly than they can be taken. The most certain preventive is a high state of cultivation and abundant manuring of the land, by which the growth of the turnip is forced, and it is soon in the rough leaf, after which the danger from the fly is over. Against the black caterpillar the only means yet found effectual is driving a large flock of poultry over the land, which devours great quantities of them. Mangel-wurzel has been cultivated by many on the better kinds of loam with various success: in some years they succeed to admiration, and in others fail entirely. There has been a fluctuation in the opinion of farmers with respect to mangel-wurzel; the majority seem now to prefer the Swedish turnip, or Ruta Baga, as more nutricious for feeding stock, and not more liable to failure, with proper attention.

The implements used in the cultivation of the soil are very various. The ploughs in common use are the small swing plough with a single stilt or horn, evidently slightly varied from the Flemish plough, and the same plough with a more upright beam resting on a carriage with two wheels. The peculiarity of the Norfolk wheel-plough is the shortness of the beam, the wheels being very little before the coulter This makes it much lighter in the hand, although not so steady, if it meets with any obstruction; but it suits the shallow furrow which is usually turned up, and it is so easily managed, that boys twelve and fourteen years old may be seen holding one of them without any apparent exertion, unless it be at the end of the furrow, when it is turned into a new one; and even then a little practice soon enables a boy to let it slide on the edge of the turn-furrow till it enters the ground again. There is scarcely an example of a plough being drawn by more than two horses, which are yoked abreast and driven with rein by the ploughman. The work is so light in general, that the horses work at a brisk pace, and at two yokings, of five hours each, will turn over from one acre and a half to two acres of ground. Four inches is the usual depth, and often even less. The harrows are similar to those used in other counties. The break-harrow or drag has large iron tines, which enter several inches into the ground and divide the sods and clods in the heavy loams. The small harrows are usually compounded of several separate harrows, in order to suit the convex form of the stitches, and harrow every part equally. Barley rollers are essential in the light soils; and in the stiffer loams the spiked roller is found very efficacious in bringing the soil to a fine tilth for receiving the barley and grass seeds.

Portable and fixed threshing-machines are very common, and, when well constructed, are a great convenience, if not an absolute saving, to the farmer. The labourers have foolishly attributed the want of employment, by which they were suffering some years past, to the introduction of machinery in agriculture; and many farmers have been forced to return to the old method of threshing by the flail. But hand-labour might be much more profitably employed in the improvement and preparation of the soil by dibbling, forking, hoeing, and draining; and where these operations are carried on with spirit, the labourer will never complain of being saved the laborious task of wielding the flail from morning till night.

Large barns were once thought necessary to house all the corn in; and the barley was often trod tight in the barn by horses led over it, as it was unloaded from the waggons. But no barns could now hold the produce of many of the larger farms, and stacks well thatched are found to preserve the corn better than close barns, especially when they are built on frames supported by stone, or cast-iron pillars with caps over them, to prevent the rats and mice from making lodgments in the straw. A very ingenious staddle has been invented, all of wrought-iron except the pillars, which are cast. It is cheap and portable, and can be readily moved from one spot to another, where it may be most convenient to build the stack.

On the light lands large flocks of sheep are constantly kept. The old horned and black-legged sheep, which have been in the county from time immemorial, are now in a great measure superseded by the Leicester and South Down breeds. The Norfolk sheep are good, and their flesh superior to most other mutton, at a proper age; but they are great wanderers and trespassers. There are few fences which will keep them in; and since almost all the commons have been divided and enclosed, the quiet sheep are preferred. Of late the Norfolk sheep have been more noticed, and crosses of them with other breeds have been attempted with some success.

When the land is too retentive of moisture to allow sheep to be folded on it in autumn or spring, and yet good turnips may be raised in it, the usual practice in such a case is to fatten bullocks on the turnips and straw in yards or sheds. When the turnips fail before the beasts are fat, linseed cakes must be given to them, which is seldom profitable, except it be by the increase of the manure and its improved quality. When an ox can be entirely fatted from the produce of the farm, the profit is more certain than when food is purchased elsewhere. The favourite oxen of the Norfolk farmer are the small Scotch breeds, Galloway, Aberdeenshire, or West Highland. They fatten readily, are soon fit for the market, and always bring the best price, according to their weight.

There were formerly some considerable dairies in Norfolk, and butter was salted and in repute for ship store or private use; but the land is now mostly arable; sheep give less trouble and are found equally profitable; so that very few if any large dairies are to be met with. The cows kept for

private use are mostly of the polled Suffolk breed, which give much and tolerably rich milk. Some cows of this breed have been known to give eight gallons of milk per day a month after calving. There was a custom in Norfolk formerly of letting a cow and her calf run together in a good pasture for a twelvemonth, when they both became very fat and were sold to the butcher. The yearling calf was called a *beeffin*. The flesh was tender, neither like veal nor beef, but preferred by many to either. This practice is now nearly obsolete.

Many farmers in Norfolk breed horses from their working mares; and excellent coach-horses are sometimes produced by a cross with a good bony blood-horse. Very little of the labour of the mare is lost, and that principally in summer, when the foal is very young. She is then worked slightly, but by wheat-sowing time she can do a full day's work, with proper keep, without any detriment to the foal. Thus an extra mare or two may be kept above the number of horses actually required for the farm, which will much assist the operations and expedite the tillage, while they cost but little to the farmer, as the foal will generally repay his own keep with a profit, which goes towards the keep of the mare. Some horses got by a thorough-bred horse out of an active Suffolk cart-mare have proved excellent hunters, and been sold at high prices when five years old, having done sufficient work to pay for their keep from the time they were three years of age.

The Norfolk pigs are generally small and white, with long thin ears, differing in this from the Suffolk breed; but they are so intermixed and crossed, that no very distinct character can be ascribed to them. Those who are curious in the breed of this useful animal cross various breeds according to their fancy, and, by selecting those which fatten early and readily, they produce varieties more or less perfect. Many pigs from Suffolk and Essex, and some from Berkshire, are brought to Norfolk to feed in the stubbles after harvest, or to consume the barley which may have suffered from the weather and is not fit for malting.

Norfolk turkeys are well known as of peculiar size and delicacy. Great numbers are reared every year, and after gleaning the stubbles and having plenty of barley till near Christmas, they are sent to supply the London market. A week before Christmas many of the coaches from Norfolk are completely loaded with turkeys, and travellers are often disappointed of places.

The game with which Norfolk abounds was at one time a source of grievance to the farmer, not only in consequence of its depredations, but of the damage done to his fences by licensed and unlicensed sportsmen. The late law, which permits the sale of game, has greatly diminished the number of preserves and the quantity of game, leaving however sufficient sport for those who are satisfied with moderate slaughter.

The Norfolk farmer has numerous advantages in the disposal of the produce of his land. There are many excellent markets in every part of the county, with easy access to the coast by water-carriage, the county being nearly surrounded by the sea and intersected by rivers and canals.

The principal fairs in Norfolk are:—Attleborough, Thursday before Easter, Thursday before Whit-Sunday, August 15; Aylsham, March 25, last Tuesday in September, October 6; Broomhall, Monday after Holy Thursday, November 20; Burnham, Easter Monday, August 1; Causton, February 1, last Wednesday in April and August; Cley, last Friday in July; Crepingham Magna, August 12; Cromer, Whit-Monday; Dereham, Thursday before July 6, Thursday before September 29; Diss, November 8; Downham, May 29, November 13; East Harling, May 4, September 20, October 24; Fincham, March 3, August 9; Gaywood, June 22; Harleston, July 5, September 9, November 28, for Scotch cattle, lasts a month; Harpley, July 24; Hempnall, Whit-Monday, December 11; Holt, April 25, November 25; Kenninghall, July 18, September 4, sheep show; Kipton-Ash, September 4, sheep show; Loddon, Easter Monday, Monday after November 21; Lynn, February 14, lasts eight days, October 16; Massingham, Tuesday before Easter, November 8; Norwich, Maunday Thursday, Easter Monday and Tuesday, Whit-Monday; St. Faith, October 17; Stowbridge, Saturday after Whit-Sunday; Swaffham, May 12, July 21, November 3; Thetford, May 14, August 2, September 25; Watton, July 10, October 10, November 4; Yarmouth, Friday and Saturday in Easter week.

Divisions, Towns, &c.—Norfolk is divided into thirty-three hundreds, which, with their situation, area, and population in 1831, are as follows. Norwich is a city and county of itself

Hundred.	Situation.	Acres.	Pop. 1831.
Blofield	Central	20,290	5,290
Brothercross	N.	18,720	4,143
Clackclose	W.	91,880	17,663
Clavering	S.E.	28,880	6,611
Depwade	Central	30,950	10,031
Diss	S.	25,450	9,300
Earsham	S.	24,560	8,485
Erpingham, North	N.E	35,770	10,160
Erpingham, South	Central	50,760	14,898
Eynsford	Central	49,990	10,957
Flegg, East	E.	14,660	24,113
Flegg, West	E.	18,370	4,212
Forehoe	Central	41,130	13,838
Freebridge Lynn	W	78,390	25,597
Freebridge Marshland	W.	57,280	11,274
Gallow	Central	44,480	9,378
Greenhoe, North	N.	32,120	10,411
Greenhoe, South	Central	63,850	10,237
Grimshoe	S.W.	69,340	6,380
Guiltcross	S.	29,900	6,761
Happing	E.	30,240	6,446
Henstead	Central	19,770	5,410
Holt	N.	42,290	10,416
Humbleyard	Central	22,620	5,409
Launditch	Central	59,930	12,639
Loddon	S.E.	26,750	7,457
Mitford	Central	33,570	11,495
Shropham	S.	53,050	12,028
Smithdon	N.W.	45,660	8,262
Taversham	Central	30,980	7,695
Tunstead	N.E.	35,440	10,593
Walsham	E.	26,700	4,525
Wayland	Central	32,610	6,824
Norwich Liberties	Central	5,920	61,116
		1,292,300	390,054

Norfolk contains the city of Norwich; the parliamentary boroughs of Yarmouth, Lynn, and Thetford; and the towns of Attleburgh, Aylsham, New Buckenham, Burnham, Cley, Cromer, East Dereham, Diss, Downham, Fakenham, Foulsham, Harleston, East Harling, Hingham, Holt, Loddon, Reepham, Stoke Ferry, Swaffham, North Walsham, Walsingham, Watton, Wells, and Wymondham. Castle Acre, Castle Rising, North Elmham, Kleninghall, Litcham, Methwold, Snettisham, and Worsted, were formerly of importance, though now decayed. Banham, Blofield, Coltishall, Costessey, Feltwell, Gaywood, Mattishall, Shipdam, Upwell, and Walsoken, are the principal villages. Of these places, Attleburgh (pop. 1939), Aylsham (pop. 2334), Lynn (pop. 13,370), Norwich (pop. 61,116), Thetford (pop. 3462), and Yarmouth (pop. 21,115), are described in their respective articles.

New Buckenham is in Shropham hundred, 93½ miles from London.* The neighbouring village of Old Buckenham had a castle at the time of the Conquest, but this castle was pulled down and a priory of the Black Canons of St. Augustin was built from its ruins in the time of Stephen or Henry II., by William de Albini, to whose father the castle and manor had been granted. At the dissolution, the yearly revenue of this priory was estimated at 131*l.* 11*s.* 0½*d.* gross, or 108*l.* 10*s.* 2*d.* clear. In place of the old castle, William de Albini erected a new one, round which a town grew up, to which the name of New Buckenham was given. A few ruins of the gateway and keep of this castle remain. The area of the parish of New Buckenham is only 250 acres; the population in 1831 was 795, about one-third agricultural. The town is pleasantly situated, and has some neatly built houses. The church is large, and an antient structure, partly rebuilt near the close of the fifteenth century. It has a richly carved screen and some interesting monuments. The market is on Saturday, and there are two if not three yearly fairs. The living is a perpetual curacy, of the clear yearly value of 115*l.*, in the appointment of the parishioners. There were in the parish, in 1833, four day-schools (one partly supported by endowment, and one partly supported by subscription), with 65 children; and one Sunday-school with

* The distances of the towns from London are by the most frequented roads,

130 children. Old Buckenham parish contains 5520 acres, with a population of 1201, two-thirds agricultural. The church formerly belonged to the priory. The living is a perpetual curacy, of the clear yearly value of 102*l.*, in the gift of the parishioners. There were in 1833 three day-schools (two partly supported by endowment), with 60 children; and one Sunday-school, with 110 children.

Burnham is in Brothercross hundred, 117 miles from London. The parish is distinguished as Burnham Westgate, or Burnham Market, from the neighbouring parishes of Burnham Overy, Burnham Thorpe, Burnham Norton, Burnham Ulph and Sutton, and Burnham Deepdale. The parish of Burnham Westgate has an area of 2930 acres, with a population in 1831 of 1022, more than a third agricultural. The town is on the west side of a small river, the Burn, at the mouth of which is a small harbour. The present church is a neat building of stone and flint. The market has been discontinued, but a considerable corn trade is carried on; some hemp is prepared, and an iron manufactory has been established. There are two yearly fairs. The living is a rectory, with which is united a mediety of the consolidated benefices of St. Margaret's, Burnham Norton, and All Saints, Burnham Ulph. The clear yearly value is 768*l.* Burnham Ulph and Sutton, and Burnham Norton, are so close to Burnham Westgate, as to form with it one town; the aggregate area of the three parishes is 5630, with a joint population of 1569. There were in the three parishes in 1833, one infant school with 40 children; one day and boarding school with 60 children; one day-school, partly supported by subscription, with about 20 children; and two Sunday-schools, with 135 children.

Admiral Lord Nelson was a native of Burnham Thorpe, of which parish his father was rector.

Cley is in Holt hundred, 123 miles from London. It is situated on one side of a small river, and Blakeney on the other; the mouth of the river forms a harbour, called Cley and Blakeney Harbour. The area of Cley parish is 1980 acres, with a population in 1831 of 827; that of Blakeney 1630 acres, population 929: together 3610 acres; population 1756, about one-fourth agricultural. Cley consists chiefly of one street, in the centre of which is the custom-house. The church is a large and curious edifice, partly of early English architecture. The south aisle is of rich perpendicular architecture, with a fine porch. The battlements and parapets of the church are remarkably rich and fine, and the windows are of good composition. The church of Blakeney, a large old building, has a square embattled tower, and a lofty turret at one angle of the chancel, supposed to have been used as a lighthouse. There are some remains of an antient Carmelite monastery. The harbour was much improved about twenty years ago, and the trade with the north of Europe has increased. About fifty vessels, mostly small, belong to the port, some of which are employed in the oyster fishery. There is a considerable importation of corn, coal, timber and deals, hemp, iron, tar, tallow, oil-cake, &c.: the principal article of export is salt, from the salt-works of the neighbourhood. There is a market at Cley on Saturday, and a yearly fair for horses. The living of Cley is a rectory, of the clear yearly value of 338*l.*; that of Blakeney is a rectory, united with the adjacent rectory of Cockthorpe, the vicarage of Little Langham, and the perpetual curacy of Glandford, together of the clear yearly value of 506*l.*, with a glebe-house. There were in the two parishes, in 1833, two infant-schools, with 40 children; seven other day-schools, with 179 children; a day and Sunday national school, with 110 children in the week and 126 on Sundays; and two Sunday-schools, with 260 children.

Cromer is on the coast, in Erpingham hundred, 132 miles from London. There was antiently a town or village on this part of the coast called Shipdem, which was destroyed by the sea about the commencement of the fifteenth century. The sea continues to gain on the land, and several houses in Cromer have been destroyed within the memory of those now living. At very low tides large masses of wall may still be seen, which are called by sailors 'Shipdem steeple.' The town of Cromer is situated at the top of the cliffs ('the mud cliffs,' as they are termed), and consists of houses for the most part badly built and of mean appearance. The area of the parish is 600 acres; the population in 1831 was 1232. The town was formerly a fishing-place, but the pleasantness of the surrounding country and the fine sea view have attracted visitors in the bathing season. There are some good inns, and a subscription library and news-room. The bay of Cromer is very dangerous, and most of the fences and outhouses in the neighbourhood are constructed of timber obtained from wrecks: yet the place carries on some trade in coals, timber, tiles, oil-cake, and other goods. Vessels discharge their cargoes on the beach at ebb tide into carts, by which the goods are carried by a road up the cliff. Fishing is actively carried on, and the crabs and lobsters are of excellent flavour. All attempts to erect a pier have failed. The market has been discontinued; but there is a yearly fair. There is a lighthouse on the cliff, a short distance east of the town. A life-boat and Manby's apparatus for saving men from wrecks are kept. There are some batteries, erected during the last war, for the defence of the place. The church is a building of great beauty, in the perpendicular style; the tower is nearly 160 feet high, and is remarkably fine; and some other portions of the church have very excellent details. The west entrance, the chancel, and the north porch are in ruins. The living is a vicarage, of the clear yearly value of 99*l.* There were in the parish, in 1833, one infant school with 60 children; two endowed day-schools, with 70 boys and 20 girls; five other day-schools, with 59 children; one boarding-school with about 20 boys, and two Sunday-schools, with 100 children.

East Dereham is in Mitford hundred, 100½ miles from London. Here was antiently a nunnery, founded in the eighth century, by St. Withburga, daughter of Anna, one of the kings of East Anglia. This nunnery was destroyed by the Danes, and the conventual church became parochial. The parish of East Dereham contains 5090 acres; the population, in 1831, was 3913, one-third agricultural. The town is pleasantly situated, and has been much improved; it consists for the most part of well-built houses; the streets are of good width, and are paved with pebbles. The market-place, which is convenient, contains a good assembly-room. The church is a large cruciform building of considerable antiquity; it has a nave with side aisles, two transepts and a choir, with a tower rising from the intersection of the nave and transepts. This tower not being considered strong enough to bear the bells, a large tower was erected in the reign of Henry VII. in the churchyard called 'the New Clocker.' There is also in the churchyard a plain but curious Norman arch covering a spring, to which medicinal virtues were formerly ascribed. The church has a rich and handsome font put up in the fifteenth century; and in the north transept is a monument to the poet Cowper, who was buried in this church, A.D. 1800. There is a good weekly market on Friday for corn, cattle, and provisions; and there are two yearly fairs for cattle, sheep, and toys. Petty sessions are held here every fortnight. The benefices are, a sinecure rectory, of the clear yearly value of 704*l.*, and a vicarage united with the chapelry of Hoo, of the clear yearly value of 478*l.*, with a glebe-house. There were, in 1833, nine day-schools, with 183 children, and four Sunday-schools, with 375 scholars.

Diss is in the hundred of Diss, 86 miles from London. The parish is divided by the Waveney from the adjacent parish of Palgrave in Suffolk; it contains an area of 3450 acres, and had, in 1831, a population of 2934, one-fourth agricultural. The town is irregularly laid out, and is on a very uneven site, but the streets are clean, and there are a number of good houses. At the extremity of the town is a large mere or pool, covering above seven acres, and abounding with eels. The church is an antient building, erected by the Fitzwalters, lords of the place; it consists of a nave with two aisles and a chancel, and a square tower at the west end. There are several dissenting places of worship in the town. There is a weekly market at Diss on Friday, and a yearly fair for cattle and toys. A few individuals are employed in the manufacture of hempen cloth, a quantity of which is sold at the weekly market. The living is a rectory, of the clear yearly value of 715*l.*, with a glebe-house. There were in the parish, in 1833, an infant school with 80 children; a school of industry, with 65 girls; fourteen day or boarding schools, with 242 children, and four Sunday-schools, with 545 children.

Downham is in Clackclose hundred, near the right bank of the Great Ouse, 84½ miles from London. This is a very antient town; according to Spelman it had the grant of a market as far back as the time of Edward the Confessor. The area of the parish is 2880 acres; the population, in 1831, was 2198, more than one-fourth agricultural. The town consists of three streets, which are well paved. The church is an antient building, with a low embattled tower,

there are also several dissenting places of worship. There are mustard-works and oil-mills in the neighbourhood, and a considerable bell-foundry in the town. The market, which is on Saturday, is well supplied with fish and fowl from the Fens. There are two if not three fairs in the year; one of which is one of the largest horse-fairs in the kingdom. The living is a rectory, of the clear yearly value of 403*l.*, with a glebe-house. There were, in 1833, a national school for 60 girls; three other day-schools, with 160 children; a boarding-school, with 89 boys; and two Sunday-schools, with 137 children.

Fakenham, distinguished from other places of the same name as Fakenham Lancaster, is in Gallow hundred, 109 miles from London. The parish has an area of 2360 acres, with a population, in 1831, of 2077, one-sixth agricultural; the hamlet of Alethorpe, belonging to this parish, has an area of 280 acres, with a population of eight persons: making in all 2640 acres and 2085 inhabitants. The town is situated near the river Wensom, on a pleasant declivity. The streets are paved. The church is handsome and commodious, consisting of a nave with two aisles, a chancel, a south porch, and a lofty western tower; this tower has a fine entrance doorway with a large window over it, and a canopied niche on each side. There is an antient market-cross. There is a corn-market on Thursday, one of the largest in the county, which is attended by corn-merchants from Wells. There are two yearly fairs held on Hampton Green, a mile from the town. The quarter-sessions for the county were formerly held here by adjournment alternately with Walsingham, but Holt has been substituted for Fakenham, and the former sessions-house has been converted into a school-room. The living is a rectory, of the clear yearly value of 862*l.*, with a glebe-house. There were, in 1833, two schools, partly supported by endowment, with 55 children; a school supported by subscription, with 42 girls; nine other day or boarding schools, with 299 children; and four Sunday-schools, with 362 children.

Foulsham is in Eynsford hundred, 110 miles from London. The area of the parish is 3100 acres, with a population, in 1831, of 958, about one-third agricultural. The town was nearly destroyed by fire in 1770; since that catastrophe the houses have been rebuilt on a more regular plan and in a more respectable style. The church is a handsome building of flint and stone, rebuilt at the same time as the town. There is a corn-market on Tuesday, and two yearly fairs, one for small dealers and one for cattle; beside a statute fair for hiring servants. The living is a rectory, of the clear yearly value of 602*l.*, with a glebe-house. There were in 1833 six day-schools, with 104 children, and two Sunday schools, with 145 children.

Harleston is in Earsham hundred, 99 miles from London. The area of the parish of Redenhall with Harleston is 1610 acres, with a population, in 1831, of 1784, less than one-fourth agricultural. Part of the town lies in the parish of Mendham, which is chiefly in Suffolk; the Norfolk portion of this parish has an area of 720 acres, with a population, in 1831, of 341, one-fourth agricultural; giving a total for Harleston of 2330 acres, with a population of 2125. The town consists of a main street along the Yarmouth road, and a convenient market-place on the south side of the main street. The 'middle row,' between the street and the market-place, is in the hamlet of Harleston, which is part of Redenhall parish. In this part is a chapel-of-ease, a plain building. There are three dissenting places of worship in the town. The river Waveney flows at a short distance to the south; there are three bridges over it in the neighbourhood. The manufacture of bombazines is carried on to a small extent; there is a well attended corn-market on Wednesday, and two considerable fairs, at which great numbers of Scotch cattle are sold. The parish church of Redenhall is situated on an elevation a mile from the town on the road to Yarmouth. It consists of a nave with two aisles, a chancel, and a fine western tower of perpendicular character. The tower was built A.D. 1460-1520, but the body of the church in the beginning of the fourteenth century.

The living is a rectory, with the chapelry of Harleston annexed, of the clear yearly value of 803*l.* There were in 1833, in the parish of Redenhall and the Norfolk portion of Mendham parish, two infant or dame schools, with 33 to 38 children; a national day and Sunday school, partly endowed, with 90 children in the week and 134 on Sundays; two day-schools, with 40 children; and one Sunday-school with 145 children.

East Harling is in the hundred of Guiltcross, 89 miles from London. The area of the parish is 2990 acres, with a population, in 1831, of 1031, about half agricultural. The town is small and has little trade. There is a weekly market on Tuesday for corn, and there are four yearly fairs, beside a statute fair for hiring servants. The church consists of a nave, two aisles, and chancel, with a south porch with a square tower and a small spire at the west end. It contains a handsome carved screen and some stained-glass windows. There are one or two dissenting places of worship. Quiddenham Hall, the seat of the earl of Albemarle, is in the neighbourhood. The living is a rectory, of the clear yearly of 523*l.* There were in 1833 three day-schools, with 127 children, and one Sunday-school with 100 children.

Hingham is in Forehoe hundred, about 100 miles from London. The area of the parish is 3630 acres, with a population, in 1831, of 1539, two-fifths agricultural. The town is irregularly laid out, but contains some good houses. The market-place is very neat. The church is large and handsome, chiefly in the decorated English style, with very good details and fine tracery in the windows. The east window of the chancel is of fine stained glass, which was brought from a nunnery in the Netherlands and presented to the church by Lord Wodehouse, A.D. 1812. Trinity chapel, attached to this church, has a window of fine stained-glass on which was a mutilated inscription: 'Thys wyndow ys ye mayden cost of Hengham:' from which it has been inferred that the window, if not the whole chapel, was erected by the contribution of the girls of Hingham. The tower is a very fine specimen of flint and stone work. There are three yearly fairs, one chiefly for horses, the others for live stock generally. The market has been given up.

The living is a rectory, of the clear yearly value of 920*l.*, with a glebe-house. There were in 1833 one dame-school with 18 children; an endowed grammar school with 97 children; a school, partly supported by subscription, with 69 children; two other day-schools, with 57 children; and one Sunday-school, with 100 children.

Holt is in the hundred of Holt, 119 miles from London. The parish has an area of 2950 acres, with a population, in 1831, of 1622, less than one-third agricultural. The town is advantageously situated at the junction of several roads in the midst of a pleasant country. It is irregularly laid out, but the houses are neatly built and the streets paved with flints. The town was nearly destroyed by a great fire in 1708, but it was much improved on being rebuilt. There are a neat and commodious sessions-house and a church. There are two dissenting places of worship. There is a well-attended market on Saturday, and there are two yearly fairs. The quarter-sessions for the county are held here twice in the year by adjournment. The living is a rectory, of the clear yearly value of 563*l.*, with a glebe-house. There were in 1833 in the parish one dame-school with 14 children; an endowed school with 60 boys, founded by Sir John Gresham and placed under the government of the Fishmongers' Company in London; seven other day-schools, with 158 children; one boarding-school with 14 children; and two Sunday-schools, with 150 children.

Loddon is in Loddon hundred, 112 or 113 miles from London through Scole Harleston, and Bungay. It is a small place situated on a stream which flows into the Yare. The village of Chedgrave is so closely adjacent that the two form one town. Loddon parish has an area of 2750 acres; population in 1831, 1175; Chedgrave, of 900 acres; population 353: together 3650 acres; population 1528. The principal street runs north and south, having Loddon church about the middle of the east side and Chedgrave church on the north-east side of the town. Loddon church is a fine stone building with an elegant tower, mostly of perpendicular character. Chedgrave church has a fine Norman door and other antient portions. There are a weekly market and two yearly fairs. The magistrates of the neighbourhood hold a monthly meeting at Loddon. The living of Loddon is a vicarage, of the clear yearly value of 300*l.*; that of Chedgrave is a rectory, of the clear yearly value of 182*l.* There were in the two parishes in 1833 one boarding-school with 17 boys; three day-schools, with from 64 to 70 children; and one Sunday-school with 48 children.

Reepham is in the hundred of Eynsford, 111 miles from London. The area of the parish is 570 acres, with a population, in 1831, of 452, almost entirely agricultural. The parishes of Hackford and Whitwell may however be added

to Reepham, as they are closely adjacent. Hackford is distinguished as Hackford-by-Reepham or sometimes Reepham-Hackford: it contains 820 acres, with a population, in 1831, of 698, one-fifth agricultural; Whitwell has 1530 acres, with a population, in 1831, of 483, two-thirds agricultural: in all 2920 acres, population 1633. The town is small, but it was formerly remarkable for having three churches, those of Reepham, Hackford, and Whitwell, in one churchyard. One of these, Hackford, was burned in the reign of Henry VIII.; the two others, Reepham and Whitwell, yet remain. The principal trade is in malt. The market is on Saturday, and there is a yearly fair. The living of Reepham is a rectory united with that of Kerdiston, of the joint clear yearly value of 699*l.*, with a glebe-house; that of Hackford or Reepham-Hackford is a rectory united with the vicarage of Whitwell, of the joint clear yearly value of 328*l.* There were in the three parishes, in 1833, one day-school, partly supported by subscription, with 36 children; seven other day-schools, with 126 children; and three Sunday-schools, with 137 children.

Stoke Ferry is in the hundred of Clackclose, 88 miles from London. The parish has an area of 1520 acres, with a population, in 1831, of 706, about one-third agricultural. The town consists of one principal street adjacent to the Wissey, over which there is a bridge. The church is toward the south end of the town. The market, which had been for a long period disused, has been revived within the last few years; it is now held on Friday, chiefly for corn. There is one yearly cattle-fair. Messrs. Whitbread and Co., the great brewers, have extensive malting establishments here. The living is a perpetual curacy, of the clear yearly value of 71*l.* There were in 1833 one day-school, partly supported by endowment, with 50 children, and two Sunday-schools, with 122 children.

Swaffham is in the hundred of South Greenhoe, 93 miles from London. The parish has an area of 8130 acres, with a population, in 1831, of 3285, about one-fourth agricultural. The town is situated on an eminence, and consists of four principal streets. The houses are generally well built, and the town has a neat theatre, an assembly-room, and a house of correction. The church, which is a large edifice in the form of a cross, consists of a nave with two aisles, a chancel, and two transept-chapels. It is the finest parish church in the neighbourhood. There is an embattled tower at the west end, with pinnacles at the corners, and a peal of eight bells; there is also a porch on the south side; the aisles are separated from the nave by fourteen arches, seven on each side, sustained by slender clustered pillars; and above them are twenty-six or twenty-eight light and elegant windows, two over each arch. In these windows are some fragments of stained glass. The roof is of finely carved oak; the church contains several monuments. There are several dissenting meeting-houses The market is held on Saturday, and there are three fairs in the year. A great deal of butter is sold. The quarter-sessions for the county are held here by adjournment at Midsummer, and races and coursing-meetings are held on an extensive heath of some thousand acres near the town. The living is a vicarage united with the rectory of Threxton, of the joint yearly value of 738*l.*, with a glebe-house. There were, in 1833, one day-school, partly supported by endowment, with 15 boys; seven other day-schools, with 215 children; and two Sunday-schools, with 263 children.

North Walsham is in the hundred of Tunstead, 123 miles from London. The area of the parish is 4010 acres; the population, in 1831, was 2615, about one-third agricultural. The town stands on a gentle eminence above the river Ant, and consists of several streets irregularly laid out. The town was almost entirely burnt in the year 1600. A market-cross, erected in the time of Edward III., was repaired after the fire by Redman, bishop of Norwich. The church is a spacious and magnificent building, an early specimen of the perpendicular style. It has a fine south porch of flint and stone, and a richly carved wooden cover to the font. The tower fell down in 1724, and has remained in ruins ever since. There are several dissenting meeting-houses and a neat theatre. The silk manufacture is prosecuted on a very small scale; there is a weekly market on Thursday, a yearly cattle-fair, and two statute fairs in the year for hiring servants. A navigable canal, connected with the navigation of the Ant and Bure, opens a water communication between this town and Yarmouth. The living is a vicarage united with the rectory of Antingham St. Mary, of the clear yearly value of 336*l.*, with a glebe-house. There were, in 1833, thirteen boarding or day schools, with about 154 children; and three Sunday-schools, with 196 children.

New Walsingham is in the hundred of North Greenhoe, 113½ miles from London. The parishes of Great or Old Walsingham and of Little or New Walsingham adjoin each other; Old Walsingham has 2170 acres, with a population, in 1831, of 434, three-fourths agricultural; New Walsingham has 860 acres, with a population of 1004, about one-fourth agricultural: together 3030 acres; population 1438. A chapel was built at Old Walsingham, and dedicated to the Annunciation of our Lady, A.D. 1061, by the widow of Richoldis de Favarches. Geoffry, her son, in the reign of William the Conqueror, founded here a monastery for Augustinian or Black Canons, and erected a conventual church, giving to the monastery the chapel built by his mother. An image of the Virgin, belonging to this foundation, was held in the very highest regard; pilgrimages to the chapel or shrine of 'Our Lady of Walsingham' were even more frequent than those to the shrine of St. Thomas à Becket, and the possessions of the priory were augmented by large endowments or costly presents. Foreigners of all nations came hither on pilgrimage, and several kings and queens of England, among them Henry VIII. in the commencement of his reign, paid their devotions here. Erasmus, who visited it, has described the riches of the chapel. The monks persuaded the people that the Milky-way in the heavens was a miraculous indication of the road to this place, whence it came to be called by some 'the Walsingham way.' The convent at the suppression had a yearly revenue of 446*l.* 14*s.* 4¾*d.* gross, or 391*l.* 11*s.* 7¼*d.* clear, beside the offerings to our Lady, valued, according to one authority, at 260*l.* 12*s.* 4*d.* yearly, but by another at 26*l.* 15*s.* only.

There are some fine remains of the convent; a richly ornamented lofty arch, supposed to have formed the east end of the conventual church, the western entrance gateway to the monastery, having a broad flattened arch; the walls, with windows and arches of the refectory, 78 feet by 27, with walls 26½ feet high; a Norman arch with zigzag mouldings, which has been removed from its original site; part of the cloisters, incorporated with the modern mansion, a stone bath, and two uncovered wells, called 'the wishing wells,' yet remain. The principal part of these ruins are included in the pleasure-grounds of Walsingham abbey, the seat of H. L. Warner, Esq. There is a fine engraving of the eastern end of the church in the last edition of Dugdale's 'Monasticon.' There was a house of Franciscan or Grey Friars at Little Walsingham, the houses and gardens of which were valued at the dissolution at 3*l.* per annum; there was also a lazar-house, founded A.D. 1492, for two leprous persons. This lazar-house has been enlarged, and is used as a bridewell. The town of New Walsingham is near the river Stiffkey. The church, which is a spacious building, contains an antient font of perpendicular character; its carving is among the richest in England, representing the seven sacraments of the Roman Catholic church and the Crucifixion. An engraving of this font is given in Britton's 'Architectural Antiquities,' vol. iv. There is a yearly fair. Quarter-sessions for the county are held here by adjournment twice in the year. There are Methodist and Independent meeting-houses. The living of Old Walsingham is a chapelry, of the clear yearly value of 168*l.*; that of New Walsingham, a donative, of the value of which there was no return. There were in the two parishes, in 1833, one endowed school, but without scholars; one school, with 12 girls, supported by private charity; seven other day-schools, with 161 children; one day and Sunday school, supported by voluntary contributions, with 37 girls; and four Sunday-schools, with 173 children.

Watton is in the hundred of Wayland, 91 miles from London. The area of the parish is 2000 acres; the population, in 1831, was 1027. The town, which is small, is in the midst of a dairy country, from which a considerable quantity of butter is sent to London. There are in the town some almshouses and a clock-tower. The church, which is at some distance from the town, has a round tower with an octangular top; it is supposed that some parts of the building are as old as the time of Henry I. There is a weekly market on Wednesday, three antient fairs, and two others of modern establishment. Petty-sessions for the hundred are held monthly. The living is a vicarage, of the clear yearly value of 187*l.*, with a glebe-house. There were in

the parish, in 1833, a national day and Sunday school, with 120 children, and three day-schools, with 93 children.

Wells is in North Greenhoe hundred, 118½ miles from London. The area of the parish is 2250 acres, with a population, in 1831, of 3624. The town is on a slight elevation rising above the marshy flat which here lines the coast, and about half a mile from the sea, on a creek, the mouth of which forms the harbour. The shifting sands render this harbour difficult of access, but considerable improvements have been made in it. The town consists of two principal streets, partially paved, and of some smaller streets. There is a custom-house on the quay; there is also a theatre. The trade of the port is considerable. Corn and malt are shipped; and coals, timber, deals, bark, oil-cake, tar, and wine are imported. There is a yearly fair. Petty-sessions for the hundred are held every fortnight. Several of the townsmen are engaged as seamen in registered vessels, or in the oyster or other fishery. The living is a rectory, of the clear yearly value of 738*l*., with a glebe-house. There were in the parish, in 1833, six infant or dame schools, with 124 children; two endowed day-schools, with 60 children; two schools, supported by private charity, with 60 children; eight other day-schools, with 277 children; and two Sunday-schools, with 339 children.

Wymondham (pronounced and occasionally written Windham) is in Forehoe hundred, 100 miles from London. The parish comprehends six divisions, having an aggregate area of 11,240 acres, with a population, in 1831, of 5485. A priory of Black or Benedictine monks was established here before A.D. 1107, by William de Albini, chief butler to Henry I. It was at first a cell to St. Alban's abbey, but was separated from it and erected into an independent abbey about A.D. 1448. It had ten or twelve monks: the yearly revenue at the dissolution was 211*l*. 16*s* 6½*d*. gross, or 72*l*. 5*s*. 4*d*. clear. The only part of the conventual buildings now remaining is a portion of the church, which is now used as the parish church. The town grew into importance through the monastery. Ket the Tanner, who raised a rebellion in the county in the reign of Edward VI., was a native of this town.

The town of Wymondham is of considerable extent, and has been much improved of late years. The church was originally cruciform, consisting of a nave with side aisles, the south aisle having the monks' lodgings over it, two chapels forming transepts, a choir, with Lady chapel on the north side, and a tower rising from the intersection of the nave and transepts. There were a chapter-house and other conventual buildings. Between the years 1410 and 1476 the inhabitants built another tower at the western end. The part now remaining consists of the nave with the side aisles (the south aisle having been rebuilt), the western tower, a considerable portion of the central tower, and some fragments of the walls of other parts. The architecture is of different styles and periods; the Norman arches of the nave may be regarded as belonging to the original building. There are several dissenting meeting-houses at Wymondham, and a house of correction. The bombazine manufacture is carried on to a considerable extent; the whole number of persons employed in it is probably near 1000. There are a market on Friday, two yearly fairs for horses and cattle, and occasional statute fairs for hiring servants. The living is a vicarage, of the clear yearly value of 515*l*., with a glebe-house. There were, in 1833, two day-schools, partly supported by an endowment, with 140 children; three other day-schools, with 110 children; and five Sunday-schools, with 590 children. There is an endowment for a free grammar-school, but the Report in 1833 states that 'there had been no child instructed therein for many years.'

Of the places formerly of note, but now decayed, may be mentioned North Elmham in Launditch hundred, 5 miles north of East Dereham. In the Saxon time this was for four centuries (A.D. 673-1075) the seat of a bishopric; and after the see was removed to Thetford, and subsequently to Norwich, the bishops continued to reside occasionally in the manor-house here, which bishop Spencer, in the time of Richard II., obtained leave to convert into a castle. The entrenchment surrounding this castle still remains, and encloses about five acres of land. There are a few remains of the palace, overgrown with briars and thorns, and some traces of the cathedral. The parish has an area of 5000 acres, with a population, in 1831, of 1153. The living is a vicarage, of the clear yearly value of 316*l*. The see was formed by dismemberment from that of Dunwich. The two sees were reunited probably about 870 or 871.

Castle Acre is in the hundred of Freebridge Lynn, 4 miles north of Swaffham, on the north bank of the Nar. It is probable that this was a Roman station, for several coins and a tessellated pavement have been dug up here. The castle, from which the place probably gets its name, was erected by William earl of Warren and Surrey, to whom the lordship had been granted by the Conqueror. It occupied the southern side of a hill sloping toward the river, and consisted of three parts or divisions, each fortified with mounds, ditches, and walls, but connected with each other. The earthworks remain, as well as fragments of the building. The principal street of the present village passes through one of the main entrances of the castle; this entrance consists of an outer and inner gate, with a portcullis between them, and two circular bastions to defend the approach. There are traces of a similar entrance at the southern end of the street. Earl Warren founded also a priory of Cluniac monks near his castle; the yearly revenues of which priory at the dissolution were estimated at 324*l*. 17*s*. 5¾*d*. gross, or 306*l*. 11*s*. 4¾*d*. clear. There are considerable remains of this religious house. The ruins of the west front of the church and the towers at the angles are a fine specimen of enriched Norman architecture. There are three doorways in this front; the central and principal one has a number of fine zigzag and other mouldings. The large west window over this doorway forms an exception to the general character of the front, being of perpendicular architecture, but much mutilated; there are pointed arches, or remains of them, on each side of this large window. Some large columns of the nave, but only one in a perfect state, the walls of the transepts, and considerable remnants of the conventual buildings to the south of the church, of the prior's house adjacent to the south-western angle of the church, of the porter's lodge, and of the barn of the monastery, are remaining. The site of the monastery within what may be called the walled precinct contains nearly thirty acres. The village of Castle Acre is still considerable. The area of the parish is 3210 acres; the population, in 1831, was 1333. There are two dissenting places of worship, and in 1833 there were three day-schools, with 125 children, and three Sunday-schools, with 225 children. The living is a vicarage, of the yearly value of which no return has been made. There are two yearly fairs, and the magistrates hold a meeting here once a fortnight.

Castle Rising, also in the hundred of Freebridge Lynn, 5 miles north-west of Lynn, and 2 miles from the Wash, on the Rising or Habingly river, is a place of great antiquity; an old verse, preserved by tradition, declares that 'Rising was a seaport town when Lynn was but a marsh.' It is thought that Alfred the Great built a castle here; at any rate William de Albini, to whose ancestors the Conqueror gave several lordships in the county, built a castle here before 1176; and this edifice appears to enclose a fragment of a more antient building. The trade of the place was considerable, and the town was incorporated, but at what period is not clear; however, the harbour, being choked up with sand, was deserted, and the place fell into decay. It received the elective franchise in the time of Philip and Mary; but from the decay of the town the number of voters was diminished to two or three, when the franchise was taken away by the Reform Act. The corporation has almost dwindled away. The parish and borough contains 2330 acres, with a population, in 1831, of 358, more than half agricultural. There are considerable remains of the castle; the keep is standing, though much dilapidated; the walls are three yards thick, and the division and arrangement of the apartments are very obvious. It stands in a ballium or court surrounded by a moat and embankment. The general style of the building is Norman, and bears a resemblance to that of Norwich castle. Isabella of France, queen of Edward II., was kept in confinement in this castle by her son Edward III., from A.D. 1330 till her death in 1358. The church is a very antient structure; the west front is of remarkably fine Norman composition; it has a fine doorway with varied mouldings, and a large window above, with a series of intersecting arches on each side. The font is antient and highly ornamented. The living is a rectory consolidated with that of Roydon, of the clear yearly value of 419*l*., with a glebe-house. There were, in 1833, two day-schools, with 67 children, and two Sunday-schools, with 61 children.

Kenninghall, in Guiltcross hundred, in the neighbourhood of East Harling, is on the Ikeneld Street, and was once a residence of the princes of East Anglia, from which circumstance it derives its name, Cyning-Halla, 'King's Hall' or palace. The site of this palace, which is still discernible, is called 'Candleyards,' a corruption probably of Cyning-hall-yards, and consists of an area of four acres, surrounded by a ditch, and having an artificial mound at each corner. The lordship was conferred by the Conqueror on William de Albini, from whose family it descended to the Montalts, the Mowbrays, and the Howards. The splendid manorial residence of these nobles was forfeited to the crown on the attainder of the duke of Norfolk in the time of king Henry VIII., by whom it was conferred on his daughter the princess Mary, who, as well as her sister Elizabeth, occasionally resided here: it is now pulled down. The church, which is antient, has a south door of very singular Norman composition. The market of Kenninghall has been for many years discontinued. The area of the parish is 3660 acres; the population, in 1831, was 1251, more than half agricultural. The living is a vicarage, of the clear yearly value of 250*l*., with a glebe-house. There were, in 1833, two boarding and day schools, with 55 children; three day-schools, with 76 children; and two Sunday-schools, with 260 children.

Litcham is in Launditch hundred, 8 miles north-west of East Dereham. The area of the parish is 2060 acres; the population, in 1831, was 771, more than a third agricultural. It was formerly a market-town, but the market has been discontinued; the place however still continues to be the mart of the surrounding villages. The church is an antient structure. There were, in 1833, one day-school, partly supported by subscription, with 70 children; one other day-school, with 20 children; one boarding-school, with 10 children; and one Sunday-school, with 50 children.

Methwold is in Grimshoe hundred, between Brandon and Stoke Ferry. The parish has an area of 13,530 acres, with a population, in 1831, of 1266, about three-fourths agricultural. The market has fallen into disuse. There are a handsome church with an embattled tower, and a Methodist meeting-house. The living is a vicarage united with the rectory of Cranwich or Cranwick, of the clear yearly value of 450*l*., with a glebe-house. There were, in 1833, one day-school, with 36 children, supported by the duchy of Lancaster; one day and Sunday school, with 16 children in the week and about 22 on Sundays, partly supported by private charity; and one Sunday-school with 217 children.

Snettisham is in Smithdon hundred, about 11½ miles north by east of Lynn, not far from the Wash. The area of the parish is 5580 acres, with a population, in 1831, of 926, nearly two-thirds agricultural. The market has been discontinued. There are a church and a Methodist meeting-house. Several brass 'celts,' antient instruments of disputed origin and use, have been dug up in this neighbourhood. The living is a rectory, of the clear yearly value of 110*l*., with a glebe-house. There were, in 1833, one endowed school with 35 children; a school, partly supported by charity, for 47 girls; five other day-schools, with 81 children; one boarding school, with 28 children; and two Sunday-schools, with 73 children.

Worsted is in Tunstead hundred, 12 miles north-north-east of Norwich. The area of the parish is 2410 acres; the population in 1831 was 830, more than half agricultural. This place was formerly the seat of a considerable manufacture, introduced by the Flemings, of woollen twists and stuffs, called from it 'Worsted goods;' but this manufacture was in the reigns of Richard II. and Henry IV. removed to Norwich, where indeed it had been previously established. The market has been discontinued; and the town has now scarcely any manufacture and little trade, though the latter is facilitated by the canal from the river Ant up to North Walsham, which passes near the town. The church is a fine building, consisting of nave, chancel, and tower: the nave and chancel are partly of decorated, but chiefly of perpendicular character; the tower is of decorated character, and is of very admirable arrangement and composition. It is strengthened by rich buttresses and is crowned with pinnacles. There is in the church a font of peculiar richness with delicately pannelled sides; the pedestal has niches and buttresses, and the risers of the steps are pannelled. The cover of this font is of wood, of rich 'tabernacle work.' There is also a fine wooden screen. The living is a vicarage, of the clear yearly value of 251*l*. There were in the parish, in 1833, five day-schools, with 87 children, and two Sunday-schools, with 134 children.

The villages require only very slight notice. Banham (pop. in 1831, 1297) is in Guiltcross hundred, about 2 miles north-east of Kenninghall: it has a small endowment for a school. Blofield (pop. 1092) is in Blofield hundred, 7 miles from Norwich on the road to Yarmouth. It has several schools, one supported by endowment, another by private charity. Coltishall (pop. 868) is in South Erpingham hundred, on the river Bure, 7 miles from Norwich on the road to North Walsham: it has an endowed free-school. Costessey (popularly Cossey) (pop. 1098) is in Forehoe hundred, on the river Wensum, 4 miles from Norwich. It has the fine seat and park of Costessey Hall, the seat of Jerningham lord Stafford. The house is partly antient, partly modern. Contiguous to the house is a handsome Gothic chapel, erected by Edward Jerningham, Esq., a branch of the family. Feltwell (pop. 1231) is in Grimshoe hundred, about 2 miles south of Methwold. It consists of two antient parishes consolidated. Gaywood (pop. 924) is in the hundred of Freebridge Lynn, about a mile from Lynn, and consists of a principal street on the road to Swaffham. It has a large national school. The church serves for the adjoining parish of Bawsey, as well as for Gaywood. Mattishall (pop. 1093) is in Mitford hundred, 11 miles west of Norwich: some manufacture, probably of Norwich stuffs, is carried on. Stripdam (pop. 1889) is also in Mitford hundred, between East Dereham and Watton. There is an endowed school here. It has a handsome church. Upwell (pop., including the chapelry of Welney, 4156, on an area of 22,360 acres) is partly in Clackclose hundred, partly in Wisbeach hundred, Cambridgeshire, chiefly in the former. The village is on a branch of the river Nene, which here forms the boundary between the two counties. There are large garden-grounds in the neighbourhood. The church is on the Norfolk side of the stream. There are a Methodist meeting-house and a charity-school. Walsoken (pop. 1856, on an area of 8800 acres) is in Freebridge Marshland hundred, in the immediate neighbourhood of Wisbeach, to the inhabitants of which the pleasant walks round the village offer an agreeable promenade. Walsoken, with the neighbouring villages of Walton and Walpole, derives its name from its situation, adjacent to an old Roman wall or embankment for securing the country against the inundation of the sea.

Divisions for Ecclesiastical and Legal purposes.—This county is included in the diocese of Norwich, which comprehends Norfolk, Suffolk, and a few parishes in Cambridgeshire. [NORWICH, DIOCESE OF.] Norfolk is divided between the two archdeaconries of I. Norwich and II. Norfolk. I. The archdeaconry of Norwich includes the eleven rural deaneries of—1, Blofield, 2, Breckles, 3, Brisley, 4, Flegg, 5, Holt, 6, Ingworth, 7, Lynn, 8, Taverham, 9, Thetford, 10, Toftrees, and 11, Walsingham. Of these it is proposed that the deanery of Lynn shall be added to the diocese of Ely. II. The archdeaconry of Norfolk includes the thirteen rural deaneries of—1, Brooke, 2, Burnham, 3, Cranewise, or Cranwich, 4, Depwade, 5 Fincham, 6, Hingham, 7 Hitcham, 8, Humbleyard, 9, Reddenhall, 10, Repps, 11, Rockland, 12, Sparham, and 13, Waxton. Of these, it is proposed that Fincham should be added to the diocese of Ely. In Browne Willis's enumeration there are 354 churches and chapels in the former of the two archdeaconries, and 446 in the latter making just 800 in the whole county. In Lewis's 'Topographical Dictionary,' the number of parishes is given at 756; of which 441 are rectories, 171 vicarages, and 78 perpetual curacies; the remaining 66 are not specified.

Norfolk is in the Norfolk circuit, and the assizes are held at Norwich. The quarter-sessions are held at Norwich; from thence the Epiphany, Easter, and Michaelmas sessions are adjourned to King's Lynn, the Midsummer sessions to Swaffham; the Epiphany and Midsummer sessions are further adjourned to Walsingham; the Easter and Michaelmas sessions to Holt.

The county gaol is at Norwich, adjacent to the keep of the castle. The old prison, restricted to the walls of the antient fortress, having been found insufficient for the increasing number of prisoners, the new gaol adjoining it was erected in 1824, at an expense of 50,000*l*. It consists of a keeper's house of octagonal form and three radiating wings. The site is not considered to be well chosen, the sun and air being obstructed by the dense mass of the old castle, and the various buildings are

too much crowded together. The discipline of the gaol (by Report of Inspector, Feb. 1, 1836) was considered too lax: but the defects of management result in a great degree from the inconvenient construction and arrangement of the prison. There are houses of correction at Swaffham, Little Walsingham, and Wymondham. There are borough gaols at Norwich, Yarmouth, King's Lynn, and Thetford. The number of prisoners for the county, committed from October in the year 1833 to October in the year 1834, was 1757, viz. 842 to Norwich Castle, 346 to Swaffham, 467 to Little Walsingham, and 102 to Wymondham; in 1834-5, 1665, viz. 801 to Norwich, 333 to Swaffham, 425 to Little Walsingham, and 106 to Wymondham; and in 1835-6, 1541, viz. 718 to Norwich, 287 to Swaffham, 427 to Little Walsingham, and 109 to Wymondham. There is a County Lunatic Asylum, established in May, 1814; into which, from its establishment, up to May 1, 1836, 1020 patients had been admitted. The amount of expenditure for the county rates in 1834 was 15,875*l.* 13*s.* 2¼*d.*, the greater part by far being expended in the prosecution of criminals, maintenance of prisoners, and other charges connected with the administration of justice.

The maritime jurisdiction of the county is under the direction of the vice-admiral of Norfolk, an officer appointed under a commission from the lords of the Admiralty, who is invested with a power to hold a Court of Admiralty for the county, with judges, marshals, and other officers. An appeal lies from this court to the high Admiralty Court. A court for the liberty of the duchy of Lancaster (of the limits of which in this county we are not aware) is held at Aylsham. A court for the liberty of the duchy of Norfolk is held at Lopham, or elsewhere within the liberty, at the discretion of the duke. The extent of this liberty is considerable, and reaches beyond this county. It comprises the whole hundred of Earsham, the half-hundred of Guiltcross, several manors and demesnes in other parts of the county, and several parishes or demesnes in Suffolk, Sussex, Surrey, and in other parts of the kingdom. Within these limits the duke has the return of all writs, bills, summonses, precepts, and mandates of the king, and exercises various other rights. The court of the honour of Rhye is kept at Hingham, and that of the fee or capital lordship of Richmond, at Swaffham.

Before the passing of the Reform Act, twelve members were returned from Norfolk: two for the county, two for the city of Norwich, and two each for the boroughs of Yarmouth, Castle Rising, Lynn, and Thetford. The total number was not affected by that act; the two members lost by the disfranchisement of Castle Rising being counterbalanced by the addition of two members consequent on the division of the county. The eastern division of the county includes the eighteen hundreds of Blofield, Clavering, Depwade, Diss, Earsham, North Erpingham, South Erpingham, Eynsford, East Flegg, West Flegg, Forehoe, Happing, Henstead, Humbleyard, Loddon, Tavesham, Tunstead, and Walsham. The court for the election of members is held at Norwich; and the polling-stations are Norwich, Yarmouth, Reepham, North Walsham, and Long Stratton. The western division of the county comprehends the fifteen hundreds of Brothercross, Clackclose, Freebridge Lynn, Freebridge Marshland, Gallow, North Greenhoe, South Greenhoe, Grimshoe, Guiltcross, Holt, Launditch, Mitford, Shropham, Smithdon, and Wayland. The court for the election of members is held at Swaffham; and the polling-stations are Swaffham, Downham, Fakenham, Lynn, Thetford, and East Dereham. The boundaries of the city of Norwich and of the several boroughs were not altered, except by the incorporation with Norwich of some extra-parochial districts, and the addition of the whole of the parish of Gorlestone in Suffolk to the borough of Yarmouth, only a portion of that parish having been included in the old borough boundary.

History; Antiquities.—Norfolk formed part of the dominions of the Iceni or Simeni (Σιμενοι, Ptol.), a people who allied themselves with the Romans in the time of Claudius, but rose in arms on the attempt of Ostorius to form a line of fortified posts along the Severn, the Warwickshire Avon, and the Nene. This hasty rising was vigorously put down by that active commander. [BRITANNIA.] The more terrible rising under Boadicea followed [BOADICEA]; but on her defeat the Iceni seem to have submitted. In the Roman division of Britain, Norfolk was included in the province of Flavia Cæsariensis, which comprehended all the east side and the centre of the island. There were many British and Roman towns or posts in this county, several of which were on the shores of that æstuary, which we have noticed as occupying the valleys of the Wensum, the Yare, the Waveney, the Bure, and the district of the 'broads.' Venta (Οὐεντα, Ptol.), distinguished as Venta Icenorum from several other British towns to which the name of Venta was common, was probably at Caistor St. Edmund's, about 3 miles south of Norwich, and was the chief town of the Iceni. Branodunum and Gariannonum, mentioned in the 'Notitia Imperii,' were probably in this county; the former at Brancaster, the latter on the valley (then the æstuary) of the Waveney: and Ad Taum, mentioned in the Peutinger Table, was probably at Taesburgh, on a branch of the Yare. There are traces of several other posts, of which the names are unknown. The Iciani of the Antonine Itinerary has been placed by some antiquaries at Thetford or Ickburgh, between Brandon and Swaffham. The mouth of the great æstuary, where Yarmouth now stands, is mentioned by Ptolemy under the name Garryenus (Γαρρύενος), the first part of which evidently embodies the root of its present designation 'Yare.'

Of Venta there are some remains on the right bank of the Taes, which joins the Yare. The Romans made it their principal post on this side of the island. There are traces of this station, which comprehended a square of about 30 acres. Foundations of buildings may be traced, and sepulchral urns and other antiquities have been dug up. The station is on a declivity toward the river: its figure approximates to a parallelogram with the corners rounded off: it was enclosed by a single rampart or mound, surmounted by a wall and defended by a ditch. There was formerly a raised mound in each corner. Of a massy tower near the river, designed to guard the gate toward the water, there are considerable remains: it is still above thirty feet high, and is composed of alternate layers of Roman bricks and of flint, imbedded in a strong cement: the outside was probably once faced with stone. The wall which surmounted the mound appears to have been built in the same manner. Many Roman bricks have been used in the erection of the parish church, which stands within the station, as the now ruined church at Reculver in Kent stands within the enclosure of the Roman Regulbium. Venta appears to have been on one of the branches of the great æstuary. Of Branodunum (Brancaster, 4 miles north-west of Burnham-market), one of the stations of the cavalry under the 'Comes Littoris Saxonici' (Count of the Saxon Coast), there are some remains. The station was just at the foot of the declivity that overlooks the marshes: the area was about eight acres. Numerous coins, urns, knives, 'styles' for writing, and other antiquities have been dug up. The site of Gariannonum, another of the posts of cavalry under the same officer, has been much disputed. Spelman proposed to fix it at Caistor, at the northern end of the 'denes' or flats along the shore by Yarmouth, from which town Caistor is distant about 2 miles. But although the name would lead us to fix a Roman post here, yet it is unlikely to have been a post for cavalry, or the chief station of the district. Burgh castle in Suffolk, at the junction of the Waveney and the Yare, has been fixed upon by most antiquaries; but though the remains show it to have been a fortification of importance [BURGH], it could hardly have been suited, situated as it then was on an island, for a post of cavalry. Another locality has consequently been proposed, viz. Whetacre or Whitaker Burgh, on the Norfolk side of the Waveney, on the extreme point of the peninsula formed by the two great branches of the æstuary, now the valleys of the Waveney and the Yare. (Robberds's *Geological and Historical Observations on the Eastern Valleys of Norfolk.*)

Ickburgh, 4 miles east of Methwold, bears in its name an indication of having been a Roman post; and from the first syllable it has been proposed to identify it with the Iciani of Antoninus: but the uncertainty of the connected stations, and the occurrence of the same element in several other names, for example Ixworth, makes it difficult to determine. The discovery of various antiquities at North Elmham, and the early importance of that place under the Saxons, lead to the supposition of its having been a Roman town or village.

The names of some places, as Attleburgh, on the road between Thetford and Norwich; Burgh, near Aylsham, in the neighbourhood of which, at Oxnead, antiquities have been discovered; Happisburgh, on the coast between Yarmouth and Cromer; Oxburgh (where are the remains of a ditch and fortification), on the Wissey, near Stoke Ferry; and the discovery of antiquities at other places,

as at Buxton, between Aylsham and Coltishall, Castle Rising; South Creak, between Burnham and Fakenham; Narborough and Narford, 5 miles north-west of Swaffham; Old Walsingham; and West Acre, near Castle Acre, render it probable that they had a Roman origin; and it may be observed that nearly all of them are on the sea or on the verge of those marshy valleys which line the banks of the chief rivers, and which, whether belonging to the system of the Yare or the Ouse, we have every reason to think were æstuaries in the time of the Romans.

There are traces in the county of Roman or other antient roads. A road, nearly coinciding with the Norwich mail road, ran from the neighbourhood of Diss to Venta Icenorum or Caistor. This is marked in Donald and Milne's 'Map of Norfolk' as the 'Pye Road.' Another from Ixworth in Suffolk ran in nearly a direct line by Castle Acre to Holme, near St. Edmund's Point or Brancaster. This is called the Iedder or Peddar's Way. A third road ran from Venta (Caistor) or Ad Taum (Taesburgh), across the valley or æstuary of the Waveney at Bungay; this is called by Donald and Milne 'Stone Street.' The Ikenild Street crossed the Little Ouse above Thetford, and ran in the direction of Venta. Other roads ran from Venta by Burgh, near Aylsham, to the coast near Cromer; another from the same place to Brancaster; a third westward from Venta across the Great Ouse and the Nene into the Midland counties; and a fourth by Burgh Apton near Loddon, in the direction of Whetacre Burgh, probably the Roman Garianonum.

It has been inferred with considerable probability that the Saxons had obtained a settlement on parts of the east and south coasts of this island before the overthrow of the Roman empire. 'This district,' says Sir F. Palgrave, 'in the last ages of the Roman empire was placed under the command of a military count, called "Comes Littoris Saxonici." It has been supposed that this shore was so called merely because it was open to the incursions of the Saxons: but it is most probable that they, like the Scots, succeeded in fixing themselves in some portion of the district, for it appears a strange anomaly that a country should be named not from its inhabitants but from its assailants; and in the "Littus Saxonicum" of Gaul they had obtained a permanent domicile not far from Bayeux.' ('History of England,' in the *Family Library*.) This early settlement of the Saxons was probably chiefly in the counties of Norfolk and Suffolk, and perhaps Essex, and will serve to account for some circumstances in the subsequent history of those districts which are otherwise unaccountable.

The time of this settlement can only be conjectured; the most probable period was the usurpation of Carausius in this island, during the reign of Diocletian and Maximian in the other parts of the Roman empire. Carausius was himself a seaman and cultivated the alliance of the Saxons, and employed them in the fleet by which he long bade defiance to the power of the emperors. It is not unlikely that to him may be ascribed the erection of those forts in Norfolk and Suffolk called 'burgi,' or towers, which at once restrained his barbarous allies and defended the æstuaries and coast from attack; and of which traces remain in the frequent occurrence of the Teutonic termination 'burgh.' The subsequent usurpers who arose in Britain probably encouraged new settlements of Saxons, whose warlike habits rendered them serviceable soldiers in the bloody contests then carried on.

In the general conquest of England by the Saxons and their kindred tribes, Norfolk and Suffolk and some parts of the adjacent counties were formed into the kingdom of East Anglia, constituted probably by the coalition of the independent settlements of the 'North folk' and the 'South folk,' that is, of the people north and south of the æstuaries of the Waveney and the Little Ouse.

The settlement of the Angles here (A.D. 527) was attended by many battles, but the contest does not appear to have been protracted or severe, and in a very few years (A.D. 534) the barbarians were sufficiently strong to invade the banks of the Rhine, and furnish the only instance upon record of the insular Saxons assailing the Continent. This comparatively easy formation of an extensive state, and the early development of its aggressive power, can only be accounted for by the supposition that the founders of the East Anglian settlements landed on a coast already settled by men of the same origin and of kindred habits; it may be received then as a corroboration of the conjecture that Carausius or some other ruler had already located the Saxons here.

The history of the East Anglian expedition to the Continent (A.D. 534-47) is singular. The hand of an East Anglian princess had been solicited by the Prince of the Varnians, who lived somewhere between the Rhine and the North Sea. Political reasons led the Varnian to reject the lady whom he had wooed, in order to marry his father's widow, a Frankish princess. The rejected fair one, supported by her countrymen, invaded his territories, defeated his army, took him prisoner, and compelled him to repudiate his Frankish wife and fulfil his first engagement.

It was not till some years after this that the settlements of the East Angles were consolidated into a monarchy. Uffa was the first who is spoken of as king of East Anglia, about A.D. 571. His successors were called from him Uffingas, popularly corrupted in an after-age into Fikeys. Under his grandson Redwald, East Anglia became a powerful state. Redwald protected Edwin the fugitive prince of Deira; and taking arms on his behalf, defeated and slew Ethelfrith of Bernicia, who had expelled Edwin and seized his kingdom. Redwald became bretwalda, or supreme head of the Anglo-Saxons. He had embraced Christianity, but was not able to introduce it into his dominions except by a compromise with the hereditary idolatry of his subjects; and Christ and Odin were worshiped in the same temple. Eorpwald and Sigebert, the sons of Redwald, who successively ascended the throne, succeeded in establishing Christianity. Sigebert was an encourager of learning, and founded a school, which some consider to have been the germ of the university of Cambridge. East Anglia however ceased to be a powerful kingdom; it became subject to the supremacy of Edwin, now bretwalda, or head of the Anglo-Saxons.

Sigebert had just abdicated his throne and retired to a monastery (A.D. 633) when his successor Egeric or Egric, brother of Redwald, who had previously ruled over a part of the kingdom, was attacked by Penda of Mercia. The East Angles by main force drew Sigebert from his retreat and compelled him to accompany them to the field, hoping for victory under the guidance of so pious a prince. They were defeated; and Sigebert, who refused to bear arms and carried only a white wand, was slain, as well as Egric. Annas, nephew of Redwald, succeeded, but he too was many years afterwards killed by Penda (A.D. 654). His brother and successor Ethelhere, accompanying Penda in his attack upon Oswio of Northumberland, was with him defeated and slain in Winwidfield, or the plain of the river Winwid, near Leeds in Yorkshire (A.D. 655). Some obscure princes, of whom the names are barely known, succeeded; but in 792, Ethelbert or Agelbright, a prince of greater reputation, was king. He visited the court of Offa, the powerful king of Mercia, to solicit the hand of his daughter, but was murdered by the Mercian king, at the instigation of his wife (A.D. 792), and his kingdom annexed to Mercia. The Mercian power was not sufficient to repress anarchy, which was probably promoted by the disjointed nature of East Anglia, consisting of peninsulas and islands, separated by arms of the sea, and probably inhabited by a race maintaining more of their original character than the other Anglo-Saxons. On the defeat of the Mercians by Egbert, they rose in arms to assert their independence, and Beornwulf and Ludican, kings of Mercia, were successively defeated and slain by them. They appear however to have submitted quietly to the supremacy of Egbert.

Shortly before the death of Ethelwulf, A.D. 855, Edmund was crowned king of East Anglia at a place called, by Asser, Burva. According to the chronicles he was of the 'old race of the Saxons' in Germany; and Hunstanton, near St. Edmund's Point, on the north-west coast of the county, is named as the spot on which he landed. One of the accounts of Ragnar Lodbrog, the Danish pirate, places the scene of his catastrophe in East Anglia. The tradition is that he was driven in a boat, in which he was hawking off the Danish coast, by stress of weather over to England; and entering the æstuary of the Yare, landed at Reedham, a village between Yarmouth and Norwich. The inhabitants brought him to the court of Edmund at Caistor, where he was murdered by Bern, the king's huntsman, without his master's knowledge. His death led to the subsequent invasion of East Anglia by the Danes. (Spelman's '*Icenia*,' quoted in Swinden's *History of Great Yarmouth*.) The more generally received account however places the scene of Ragnar's death in Northumberland, and ascribes it to the orders of Ella, king of that country. (Turner's *Anglo-Saxons*.)

In the great invasion of England by the Danes, or Northmen, under the sons and kinsmen of Lodbrog, East Anglia was the first part attacked. The Northmen landed and formed a camp, in which they passed the winter, demanding and receiving from the East Anglians a supply of horses (A.D. 866).

The nature of the country, its insular or peninsular character, and its separation by æstuaries and marshes from the more civilized parts of the Anglo-Saxon territories, had probably led the East Angles to retain a larger portion of their primitive character, superstitions, and habits; and this enabled and disposed them to coalesce with invaders in whose character and mode of life they would only behold a renewal of what they themselves had been. William of Malmesbury (*De Gestis Reg. Anglor.*, lib. ii, cap. 5) says, 'Orientales Angli et Northanimbri cum Danis unam in gentem coaluerunt.' It is probable indeed that from the first settlement of the barbarian allies of Carausius, the character of the inhabitants of this district had undergone comparatively little change, and hence the facility with which new swarms of barbarians were received and naturalised. In A.D. 870 the Danes returned and established themselves at Thetford. Edmund fell in an attempt to expel them. He was canonised, and has given name to St. Edmund's Bury. The dominion of the invaders became permanent. In the peace made between Alfred and Guthrun or Godrun (A.D. 883), this county was included in the Danelage or Danelagh, and though subject to the supremacy of the Anglo-Saxon kings, became Danish in its character and probably in its language, so far as this differed from the Anglo-Saxon.

Among the characteristics still remaining of Danish possession may be noticed the frequent recurrence of the termination *by*, in such names as Filby, Ormesby, Scratby, Thrigby, &c., villages in the country round Yarmouth; and perhaps the frequency of the termination *oe* or *hoe*, an island, in such names as Hadiscoe, Limpenhoe, villages in the same parts of the county, and in the names of the hundreds Forehoe, Greenhoe, and Grimshoe; there is also in the names Worsted, Tunsted, &c. the termination *sted*, which is common in Holstein and Angeln.

The submission of the East Angles to the Anglo-Saxon supremacy was unsteady. They failed in their engagements to Alfred, when he was attacked by the redoubted Hastings, A.D. 893. At the commencement of the reign of Edward the Elder (A.D. 905), they supported his competitor Ethelwald; and Eohric or Eric, a Danish chieftain of East Anglia, fell with Ethelwald in an attack upon the Kentish men in Edward's army. A treaty of peace between the East Angles and Edward was made a year or two after; and (A.D. 921) the direct sovereignty of the country appears to have passed into Edward's hands by the willing act of the people, after he had defeated some of the Anglo-Danes at Temesford in Bedfordshire, in which battle an East Anglian king or chieftain Yell. William of Malmesbury speaks of the expulsion of the East Anglian Danes, 'expulsis Danis,' but this expression is to be understood not of the Danes generally, who had probably merged in the body of the inhabitants, but only of those who were unwilling to submit to the Anglo-Saxon government.

Under the Anglo-Saxon princes, East Anglia was governed by Ealdormen. Athelstan, of the blood royal, with his sons Ethelwold or Ethelwulf (who was slain by King Edgar, in order that he might marry his wife Elfleda) and Ailwin or Ethelwin, were Ealdormen of East Anglia.

When the struggle between the Anglo-Saxons and the Danes was renewed in the reign of Ethelred II., the East Angles equipped a fleet for the defence of the island, a circumstance which indicates that they had not lost their maritime habits. At a subsequent period (A.D. 1004) East Anglia was attacked by Sweyn, king of Denmark, who brought his fleet up to Norwich, which he plundered and burnt. Ulfketul or Ulfkyttle, a man of Danish extraction, was Ealdorman of East Anglia at the time. He, being unprepared to repel the attack, first attempted negotiation, but finding that fail, he resorted to force, and defeated the invaders, who had taken and burnt Thetford. The victory was dearly bought, and the Danes, though with difficulty, escaped to their ships. In A.D. 1010, the Danes, under their leader Thurkill or Turketal, occupied East Anglia, and obtained a portion of it (probably Suffolk) in permanency by making peace with Ethelred. Ulfkytlle, who probably had retained Norfolk and other parts in the east of the island, fell in the battle of Assandren (A.D. 1016) between Edmund Ironside and Canute the Dane. In the subsequent division of the island between these princes, East Anglia fell to the former. On the death of Edmund and the accession of Canute to the sovereignty of England, Thurkill was appointed (A.D. 1017) earl (a title of Danish origin, equivalent to the Saxon Ealdorman) of the whole of East Anglia, but was soon afterwards (A.D. 1021) banished, and in his exile was killed by the peasantry of Denmark. In the reign of Edward the Confessor, the earldom of East Anglia was held by Harold, afterwards king; but when Harold, with his father and brethren, was declared an outlaw (A.D. 1051), his earldom was given to Algar, the son of Leofric, earl of Mercia. On the restoration of Harold (A.D. 1052) he resumed his earldom, but resigned it again to Algar, upon receiving the earldom of Wessex on the death of his father, earl Godwin (A.D. 1053). Two years later Algar was driven into banishment, but restored a year after. However, in A.D. 1057 he finally resigned the earldom of East Anglia for that of Chester; and East Anglia perhaps reverted to the possession of Harold, whose brother Gurth became earl of Suffolk. The limits of the kingdom and earldom of East Anglia were probably coincident with those of the East Anglian bishopric, the seat of which has long been fixed at Norwich. Its first seat was at Silthestow, afterwards called Domnoc or Dommoc, now Dunwich in Suffolk, where it was established by Sigebert, king of the East Angles, about the middle of the seventh century. In A.D. 673 the diocese was divided, a bishopric being established at North Elmham in Norfolk. About A.D. 870 or 871 the diocese was reunited under the bishop of Elmham; in A.D. 1075 the see was transferred to Thetford, and about A.D. 1094 to Norwich, where it has ever since remained.

After the Conquest the earldom of Norfolk and Suffolk was bestowed on Ralf de Guader, one of William's Breton auxiliaries according to some accounts, but according to others a native of Norfolk; but he having rebelled, was besieged in Norwich castle, and being forced to surrender, was banished, and the earldom of Norfolk bestowed on Roger Bigod, another of the companions of the Conqueror. On the death of William, Roger supported the claim of his eldest son Robert to the throne, which led to the devastation of the county. Bigod was obliged to submit to William Rufus. Hugh Bigod, one of the successors of Roger in his earldom, supported Stephen, who revived in his favour the title of earl of East Anglia. In the rebellion of the children of Henry II. against their father (A.D. 1177), Norfolk was the scene of contest; Hugh Bigod being a supporter of the young princes: he died attainted of treason. His son John succeeded to his father's title after payment of a heavy sum, in consequence of his father's attainder: he was one of the barons who extorted Magna Charta from John. In the subsequent war with the barons, the king came into this county: and it was in crossing the Wash from Lynn into Lincolnshire that he lost his baggage. The forces of Louis the Dauphin and his confederates afterwards overran this county. In the great rebellion of the Commons under Wat Tyler (A.D. 1381), the men of Norfolk took part under the command of John the Litester (or Dyer): but they were put down by the courage and activity of Henry Le Spencer, bishop of Norwich, who defeated them at North Walsham, and caused the Litester and the other leaders to be executed. At this time the manufacture of woollen stuffs was flourishing in the county; and Norwich was a large and populous city. The earldom of Norfolk had, before this, passed from the Bigod family to the Mowbrays. Thomas de Mowbray was created duke of Norfolk by Richard II. before A.D. 1380. He was banished by the king, A.D. 1398, and died at Venice two years afterwards. In the time of Edward IV., the direct male line of the Mowbrays having become extinct, the title of duke of Norfolk came to the duke of York, one of the young princes smothered in the tower by Richard III., who had married Lady Anne Mowbray, daughter of the last duke. Upon his death the dukedom was conferred by Richard on Sir John Howard, in whose family it has ever since remained. Henry VII., in order to assure himself of the loyalty of the people, visited Norfolk at the time of the imposture of Simnel: he kept his Christmas (1486?) at Norwich, and made a pilgrimage to the house of Our Lady of Walsingham.

Of the edifices of the middle ages, monastic, ecclesiastical, or castellated, Norfolk has several remains. The castle and cathedral of Norwich, the antient buildings of Lynn, and the abbey at Thetford, are noticed elsewhere. [LYNN; NORWICH; THETFORD.] Walsingham, Wymondham, and

Castle Acre, abbeys or priories, have been already described. Langley abbey is on the verge of the marshes of the valley of the Yare, 2 or 3 miles north of Loddon. It was founded A.D. 1198, by Robert Fitz-Roger Helke, or De Clavering, for Premonstratensian canons: its yearly revenues at the suppression were 128*l.* 19*s.* 9½*d.* gross, or 104*l.* 16*s.* 5*d.* clear. The abbey of St. Bennet of Hulme is in the marshes near the junction of the Bure with the Thurn and the Ant. The spot on which it was built had been granted by an East Anglian chieftain, about A.D. 800, to a society of religious Eremites, who built a chapel and other buildings here. This was destroyed by the Danes in the invasion under the sons of Lodbrog (A.D. 870). The chapel and houses were rebuilt about a century after: and King Canute founded and endowed, before A.D. 1020, a Benedictine monastery, whose yearly revenues at the dissolution were 677*l.* 9*s.* 8½*d.* gross, or 583*l.* 17*s.* 0¼*d.* clear. At West Dereham, between Stoke Ferry and Downham market, an abbey for Premonstratensian canons was founded A.D. 1188, by Hubert, then dean of York: its yearly revenues at the dissolution were 252*l.* 12*s.* 11½*d.* gross, or 228*l.* 0*s.* 0¾*d.* clear. The chapel and hospital (afterwards priory and abbey) of North Creak, 2 miles south of Burnham-market, were founded by Sir Robert de Nerford, A.D. 1206. The priory and abbey belonged to the regular canons of St. Austin: it did not continue till the dissolution. Of all these institutions there are ruins which contain some beautiful portions, chiefly in the early English style. The chief remain of that of St. Bennet of Hulme is the gate-house, over which a draining mill has been erected; and there are traces of walls enclosing an area of at least 35 acres. There are some remains of Beeston priory, founded for the canons of St. Austin, in the reign of John or of Henry III. They are near the sea, on the road between Cromer and Cley, about 3 miles from Cromer. The revenues of this priory at the dissolution were 50*l.* 6*s.* 4½*d.* gross, or 43*l.* 2*s.* 4½*d.* clear. There are a few remains of the once extensive priory of Flitcham, about 9 miles north-east of Lynn: they are used for or are incorporated in the barns, stables, or other offices of a farm-house. This priory was founded for Austin canons by Sir Robert Aguillon, in the reign of Henry III.; and had a yearly revenue at the dissolution of 62*l.* 10*s.* 6½*d.* gross, or 55*l.* 5*s.* 6½*d.* clear. Binham priory (5 miles south-east of Wells), founded by Peter de Valoines, nephew of William the Conqueror, for Benedictines, subordinate to the great abbey of St. Alban's, had at the dissolution a yearly revenue of 160*l.* 1*s.* 0*d.* gross, or 140*l.* 5*s.* 4*d.* clear. The ruins are very considerable and interesting, but are gradually mouldering away. The nave and north aisle, and a portion of the south aisle of the conventual church, with the chief part of the west front, and the ruins of the north transept, remain. The west front is of early English character, very fine: it had a beautiful large window, now blocked up with plaster. The interior of the church is of Norman architecture. The nave and north aisle are at present used as the parish church. Of Broomholm priory near the sea, between Cromer and Yarmouth, founded by William de Glanvill (A.D. 1113) for Cluniac monks, there are some remains incorporated into a farm-house, or converted into offices: revenue at the dissolution, 144*l.* 9*s.* 0¾*d.* gross, or 100*l.* 5*s.* 3½*d.* clear.

Several of the churches near the valley of the Waveney and in other parts of the county have round towers of no great dimensions, surmounted by an octagonal upper story. The origin of these towers has furnished a subject for much antiquarian conjecture. Hadiscoe church, in the valley of the Waveney, one of these, has a Norman doorway: Gillingham church, near Hadiscoe and Framlingham Earl, are chiefly of Norman architecture; the former church has a tower rising from the centre; the east end of the church, which is semicircular, is covered with thatch. Hillingdon, Thwaite, and South Lopham churches have all portions of Norman architecture. Little Snoring church has a doorway exhibiting a curious mixture of Norman and early English character. Northwold church has in the chancel against the north wall a lofty shrine, the upper part of which is composed of canopies over niches, while the lower part forms an altar tomb, on which are three figures of armed men in a posture of alarm, designed to represent the soldiers at the resurrection of our Lord. This shrine was erected for the purpose of the ceremonies used on Good-Friday and Easter-day. At Houghton, near Walsingham, is a small antient chapel, which affords a beautiful specimen of architecture, chiefly of decorated English character.

The principal castles are those at Norwich, described elsewhere [NORWICH]; Castle Acre, and Castle Rising, described above, and Caister next Yarmouth. Caister is built of brick, and has been thought to be one of the oldest brick edifices in the kingdom. Others however ascribe its erection to Sir John Fastolfe, an officer who served with great distinction in the French wars of Henry V. and VI. It was twice besieged in the war of the Roses. An embattled tower at the north-west corner, one hundred feet high, and the north and west walls remain; but the south and east sides are levelled with the ground. There are the ruins of a castle at Weeding All Saints, near the Little Ouse, opposite Brandon. The gateway of Titherington-hall, commonly called Middleton Castle, at Middleton, 4 miles south-east of Lynn, is yet standing. It is of brick, and consists of a square tower with turrets at the four corners, rising considerably higher than the rest of the tower. It was probably erected by the Lord Scales, who distinguished himself in the French wars of Henry V. and VI.

There are several antient manor-houses or halls: Oxburgh Hall, near Stoke Ferry, on a stream that flows into the Wissey, was erected near the end of the fifteenth century by Sir Edmund Bedingfield. It is wholly constructed of brick, and originally enclosed a quadrangular court, 118 feet by 92. The entrance is over a bridge (formerly a drawbridge), and through a gateway between two fine towers 80 feet high. The floors and the roofs of some of the rooms are of fine brick, and the walls are in some parts covered with old tapestry. Part of the original building has been taken down, and the disposition of the other parts changed. The whole is surrounded by a moat 52 feet broad and 10 feet deep. Of East Basham House, near Fakenham, built in the reign of Henry VII. or Henry VIII., the walls of the porter's lodge and some of the apartments on the northern side of the court remain, and are appropriated as a farm-house. At Fincham, about 4 miles east of Downham-market, is an old house, now occupied as a farmhouse, which exhibits an early specimen of the revived Grecian style in domestic architecture. Winwal House, near Stoke Ferry, is perhaps the most antient domestic edifice in England. It has Norman buttresses, and some portion of ornament in that style. It consists of two stories, each containing two apartments; the whole building is only 33 feet long by 27 deep, and scarcely 16 feet high. Oxnead Hall, and Blickling Hall near Aylsham, belong to a later period—Oxnead to that of Elizabeth, Blickling to that of James I. or Charles I.

In the disturbances which arose out of the Reformation, Norfolk became the scene of tumult. A rising took place at Attleburgh (A.D. 1548), and it soon became serious. Ket, a tanner of Wymondham, was chosen leader of the rebels, who encamped on Mousehold heath, near Norwich, to the number of 20,000. Ket, with two assessors from each hundred in the county, held a court of justice under an oak, since called 'the oak of reformation,' and issued edicts levying contributions for the support of his followers. The marquis of Northampton, who commanded a force sent to watch the rebels till a more powerful army could be collected, having entered Norwich with 1100 men, was beaten out by them with the loss of 100 men. The rebels burnt part of the city, and returned in triumph to their camp on Mousehold. They were however at length attacked by the earl of Warwick with an army that had been collected to invade Scotland, and were totally defeated in a place called Duffen Dale, to which they had retired. Ket was hanged on Norwich castle, and his brother on the tower of Wymondham church; and the rebellion, which had also broken out in other parts of England, was put down.

In the struggle between Charles I. and the parliament this county zealously embraced the side of the latter, and was one of 'the associated counties' under the earl of Manchester. The king had little hold on the county at any time. Lynn, of which his troops had taken possession, was besieged and taken by the earl of Manchester.

(Blomefield's *History of Norfolk*; Donald and Milne's *Map of Norfolk*; Conybeare and Phillips's *Outlines of the Geology of England and Wales*; Greenough's *Geological Map of England*, Robberds's *Historical and Geological Observations on the Eastern Valleys of Norfolk*; Priestley's *History of Navigable Rivers and Canals*; Lewis's *Topographical Dictionary*; *Beauties of England and Wales*; *Parliamentary Returns and Papers*; Ives's *Enquiry concerning Garianonum*; Turner's *Anglo Saxons*, and *Hist. of England in the Middle Ages*; Sir F. Palgrave's *Rise*

and Progress of the English Commonwealth, and *History of England* (*Anglo-Saxon period*), in the 'Family Library;' Rickman's *Gothic Architecture;* Britton's *Architectural Antiquities.*)

STATISTICS.

Population. – Norfolk is partly an agricultural and partly a manufacturing county; it may be ranked mostly, among the whole of the counties, as the former, being the fifteenth on the list in 1831. According to the Population Returns of 1831, of 93,498 males twenty years of age and upwards only 4740 were then employed in manufactures or in making manufacturing machinery, while 45,413 were engaged in agricultural pursuits; 37,466 of the latter number were agricultural labourers. Of the 4740 men engaged in manufactures, 3752 were employed in the manufacture of bombazine in Norwich, 247 in Wymondham, and about 300 at Marsham, Hevingham, Haynford, Bunwell, and a few other places. About 100 men were employed in hempen and linen manufactures at North and South Lopham and elsewhere; at Great Yarmouth, about 30 in winding and weaving silk, and as many perhaps in other places; a few men were employed in the various villages in the woollen manufacture, and about twenty in making agricultural machines.

The population of Norfolk at each of the four following periods, was—

	Males.	Females.	Total.	Increase per cent.
1801	129,842	143,529	273,371	..
1811	138,089	153,910	291,999	6·81
1821	166,892	177,476	344,368	17·93
1831	189,323	200,731	390,054	13·26

showing an increase between the first and last periods of 116,683, or more than 42½ per cent. on the whole population, being 14¼ per cent. below the whole rate of increase throughout England.

The following table exhibits a summary of the population of every hundred, &c., as taken in 1831.

HUNDREDS, CITIES, OR BOROUGHS.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in Agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males, twenty years of age.
Blofield (Hundred) .	888	1,055	3	20	669	246	140	2,644	2,646	5,290	1,296
Brothercross . .	872	954	11	18	534	291	129	2,047	2,096	4,143	1,064
Clacklose . .	3,288	3,621	15	94	2,269	887	465	8,809	8,854	17,663	4,415
Clavering . .	1,057	1,288	4	8	896	274	118	3,294	3,317	6,611	1,656
Depwade . . .	1,752	2,068	11	31	1,295	499	274	5,028	5,003	10,031	2,522
Diss . . .	1,647	1,933	7	53	989	541	403	4,596	4,704	9,300	2,216
Earsham . . .	1,513	1,737	2	39	1,077	464	196	4,132	4,353	8,485	1,984
Erpingham, (North) .	2,018	2,164	24	80	1,143	485	536	5,057	5,103	10,160	2,444
Erpingham, (South) .	2,994	3,293	21	90	1,841	916	536	7,382	7,516	14,898	3,632
Eynsford . .	1,841	2,351	7	40	1,440	564	347	5,524	5,433	10,957	2,769
Flegg, East . .	625	662		18	422	104	116	1,508	1,490	2,998	721
Flegg, West . .	685	835	2	11	530	142	163	2,120	2,092	4,212	1,020
Forehoe . .	2,504	2,851	17	44	1,469	1,063	319	6,912	6,926	13,838	3,364
Freebridge, (Lynn) .	2,105	2,472	20	47	1,688	514	270	6,084	6,143	12,227	2,907
Freebridge, (Marshland) . . .	2,179	2,328	11	99	1,669	394	265	5,687	5,587	11,274	2,836
Gallow . . .	1,755	2,006	9	51	1,188	461	357	4,592	4,786	9,378	2,267
Greenhoe (North) .	2,101	2,259	4	66	914	633	682	5,071	5,340	10,411	2,291
Greenhoe (South) .	1,850	2,068	8	27	1,197	596	275	5,102	5,135	10,237	2,445
Grimshoe . .	1,252	1,349	7	37	897	273	179	3,268	3,112	6,380	1,672
Guilt Cross . .	1,009	1,395	6	26	813	223	159	3,399	3,362	6,761	1,671
Happing . . .	1,198	1,413	2	18	944	257	212	3,200	3,246	6,446	1,664
Henstead . .	1,070	1,167		23	764	289	114	2,757	2,653	5,410	1,399
Holt . . .	2,102	2,289	26	54	1,164	584	541	5,122	5,294	10,416	2,593
Humbleyard . .	921	1,110	10	16	807	210	93	2,675	2,734	5,409	1,353
Launditch .	2,235	2,678	23	51	1,825	571	282	6,474	6,165	12,639	3,212
Loddon . . .	1,316	1,502	9	29	910	386	206	3,762	3,695	7,457	1,845
Mitford . . .	2,229	2,366	23	77	1,260	792	314	5,712	5,783	11,495	2,737
Shropham . .	1,493	1,760	9	32	1,184	394	182	4,311	4,255	8,566	2,136
Smithdon . .	1,494	1,781	4	58	1,165	386	230	4,122	4,140	8,262	2,082
Tavesham . .	1,428	1,582	2	85	997	412	173	3,811	3,884	7,695	1,889
Tunstead . .	2,158	2,347	7	71	1,347	570	430	5,173	5,420	10,593	2,516
Walsham . .	773	934	5	5	633	222	79	2,287	2,238	4,525	1,195
Wayland . . .	1,333	1,422	3	16	1,000	334	88	3,363	3,461	6,824	1,666
King's Lynn (Borough)	2,707	3,035	27	180	24	1,736	1,275	5,972	7,398	13,370	2,846
Norwich (City) .	13,156	14,572	67	1,050	509	9,174	4,889	27,761	33,355	61,116	14,248
Thetford (Borough) .	675	716	12	13	81	467	168	1,585	1,877	3,462	820
Yarmouth, Great (Borough) . . .	4,570	4,869	23	191	26	2,297	2,546	8,980	12,135	21,115	4,105
Totals .	74,793	84,232	439	2,868	37,610	28,871	17,751	189,323	200,731	390,034	93,498

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of—

		£.		s.	d.	
1801	were	169,733,	being	12	5	for each inhabitant.
1811	. .	291,501	„	19	11	„
1821	. .	256,044	„	14	10	„
1831	. .	299,357	„	15	4	„

The sum expended for the same purpose for the year ending March, 1838, was 167,784*l.*; and assuming that the population had increased from 1831 to 1838 at the same rate of progress as in the ten preceding years, the above sum gives an average of 7*s.* 10¼*d.* for each inhabitant. These averages are above those for the whole of England and Wales.

The sum raised in this county for poor-rate, county-rate, and other local purposes, in the year ending 25th March, 1838, was 358,006*l.*, and was levied upon the various descriptions of property as follows:—

On land . .	£281,879	0*s.*	
Dwelling-houses .	63,041	13	
Mills, factories, &c. .	8,842	19	
Manorial profits, navigations, &c.	4,242	10	
Total	£358,006	2	

The amount expended was—

For the relief of the poor	£316,654 16s.
In suits of law, removal of paupers, &c.	8,841 7
For other purposes	32,125 17
Total money expended	£357,622 0

In the Returns made up for the subsequent years the descriptions of property assessed are not specified. In the years 1834, 1835, 1836, 1837, and 1838, there were raised 355,684*l.* 18*s.*, 327,050*l.*, 275,951*l.* 18*s.*, not given for 1837, and 191,226*l.* respectively; and the expenditure of each year was as follows:—

	1834. £	1835. £	1836. £	1837. £	1838. £
For the relief of the poor	306,787	273,425	230,762	177,538	167,748
In suits of law, removal of paupers, &c.	9,535	8,064	6,697	2,613	1,637
Payments towards the county-rate	35,565	16,469	16,430	not given	18,199
For all other purposes		29,322	25,844	16,845	17,921
Total money expended	£351,937	327,300	279,733		205,541

The saving effected in the sum expended for the relief of the poor in 1838, as compared with that expended in 1834, was therefore 139,003*l.* 9*s.*, or more than 45 per cent.; and the whole sum expended was less in 1838 than it was in 1834 by 146,346*l.*, or more than 41 per cent.

The number of turnpike trusts in Norfolk, as ascertained in 1836, were 15; the number of miles of road under their charge was 271. The annual income arising from tolls and parish composition in lieu of statute duty in 1836 was 16,016*l.* 18*s.*, and the annual expenditure in the same year was as follows:—

	£.	s.	d.
Manual labour	3,087	3	0
Team labour and carriage of materials	1,036	13	0
Materials for surface repairs	2,598	9	0
Land purchased	130	12	0
Damages done in obtaining materials	144	8	0
Tradesmen's bills	824	0	0
Salaries of treasurer, clerk, and surveyor	1,122	8	0
Law charges	194	13	0
Interest of debt	2,958	5	0
Improvements	1,546	11	0
Debts paid off	543	6	0
Incidental expenses	392	7	0
Estimated value of statute duty performed	1,242	6	0
Total expenditure	£15,821	1	0

The county expenditure in 1834, exclusive of that for the relief of the poor, was 15,875*l.* 13*s.*, disbursed as follows:—

	£.	s.	d.
Bridges, building, repairs, &c.	739	5	0
Gaols, houses of correction, &c., and maintaining prisoners, &c.	7,356	13	0
Shire-halls and courts of justice, building, repairing, &c.	114	5	0
Lunatic Asylums	296	3	0
Prosecutions	3,731	16	0
Clerk of the peace	742	15	0
Conveyance of prisoners before trial	1,048	14	0
Conveyance of transports	465	15	0
Vagrants, apprehending and conveying	54	19	0
Constables, high and special	31	5	0
Coroner	329	16	0
Miscellaneous	1,024	6	0
Total expenditure	£15,875	13	0

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 1871, 2899, and 3650 respectively, making an average of 267 annually in the first period, of 404 in the second period, and of 521 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 382, 283, and 279 respectively. Among the persons charged with offences there were committed for—

	1831.	[illegible]	[illegible]
Felonies	252	[illegible]	[illegible]
Misdemeanors	80	65	41

The total number of committals in each of the same years was 337, 264, and 289 respectively.

	1831.	1832.	1833.
The number convicted was	229	189	205
The number acquitted was	78	34	47
Discharged by proclamation	30	41	37

There were 588 persons charged, in 1838, with crimes at the assizes and sessions in Norfolk. Of these 31 were charged with offences against the person, 11 of which were common assaults; 33 were charged with offences against property committed with violence; 495 with offences against property committed without violence; only 3 were charged with malicious offences; 6 for forging and uttering base coin, and 20 for various misdemeanors. Of the whole number committed 412 were convicted, 117 were acquitted, 11 were not prosecuted, and no bill was found against 46. Of those convicted one was sentenced to death, but not executed, his sentence was commuted into transportation for life; 36 were sentenced to transportation for various periods; 7 to imprisonment for 2 years, 41 for 1 year, and 288 for 6 months or under; 10 were fined, and 1 was found insane. Of the whole number of offenders, 515 were males and 73 females; 225 could neither read nor write, 270 could read and write imperfectly, 82 could read and write well, 4 had superior instruction, and the degree of instruction could not be ascertained of the remaining 7.

The number of persons registered, in 1837, to vote for county members was 15,601. Of these, 9496 were freeholders, 39 leaseholders, 1824 copyholders, 3474 occupying tenants, 210 annuitants, and 1558 whose tenures were part freehold and part copyhold; being 1 in 25 of the whole population, and 1 in 6 of the male population 20 years of age and upwards, as taken in 1831.

Norfolk contains 9 savings' banks; the number of depositors and amount of deposits, on the 20th of November in each of the following years, were as under:—

	1832.	1833.	1834.	1835.
Number of depositors	6959	7683	8473	8953
Amount of deposits	£212,809	£233,265	£250,423	£265,465

The various sums placed in the savings' banks in 1836, 1837, and 1838, were distributed as under:—

	1836.		1837.		1838.	
	Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	5,387	£38,334	5,857	£42,094	6,630	£46,049
„ 50	2,711	84,070	3,037	93,570	3,377	103,985
„ 100	1,225	83,500	1,316	90,095	1,378	95,273
„ 150	393	47,070	382	45,905	454	54,220
„ 200	214	37,287	237	40,931	257	44,347
Above 200	17	3,598	18	3,811	22	4,630
	9,947	293,949	10,847	316,406	12,118	348,500

Education.—The following summary is taken from the Parliamentary Returns on Education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant schools	133		
Number of children at such schools; ages from 2 to 7 years:—			
Males		800	
Females		782	
Sex not specified		1,169	
			2,751
Daily schools	1,091		
Number of children at such schools; ages from 4 to 14 years:			
Males		13,342	
Females		11,783	
Sex not specified		7,252	
			32,377
Schools	1,224		
Total of children under daily instruction			35,128
Sunday-schools	502		
Number of children at such schools; ages from 4 to 15 years:—			
Males		11,568	
Females		12,575	
Sex not specified		6,277	
			30,420

Assuming that the population between the ages of 2 and 15 years has increased in the same proportion as the whole of the population since 1821, and that the whole population has increased in the same ratio since 1831 as in the ten

years preceding that time, the approximate number of children between the ages of 2 and 15 thus found residing in Norfolk, in 1833, was about 130,798.

Fifty Sunday-schools are returned from places where no other school exists, and the children who are instructed therein (1994 in number) cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain.

Sixty-eight schools (containing 3737 children), which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. In some of the Sunday-schools, some persons as old as 50 years are in attendance. Making allowance for these two causes therefore, we may perhaps fairly estimate that little more than one-third of the children between the ages of 2 and 15 years are under instruction in this county.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription		By payments from scholars.		Subscrip and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	—	—	6	176	115	1,787	12	788
Daily Schools	88	2683	113	4,340	768	18,787	122	6567
Sunday Schools	12	677	448	27,124	2	103	40	2516
Total...	100	3360	567	31,640	885	20,677	174	9871

The schools established by dissenters, included in the above statement, are—

			Scholars.
Daily-schools . .	18,	containing	590
Sunday-schools . .	123	„	10,960

The schools established since 1818 are—

Infant and other daily schools	535,	containing	17,259
Sunday-schools . .	291	„	21,963

Thirty-two boarding-schools are included in the number of daily-schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by dissenters, with whom are here included Wesleyan Methodists, together with Roman Catholics.

Lending libraries of books are attached to 45 schools in this county.

NORFOLK ISLAND is situated in the Pacific Ocean, between 29° and 29° 10′ S. lat. and 168° and 168° 5′ E. long., about 900 miles from Port Jackson in Australia. It is about six miles long from north-west to south-east, and nearly four in breadth. It rises from the sea with steep cliffs to a height of from 200 to 300 feet. These cliffs consist of a hard firm clay, of a very fine texture, and there are only a few paths by which the summit can be attained. Beyond the cliffs the island extends in an uneven plain, cut in many places by deep ravines. At the north-western extremity is a high hill, called Mount Pitt, which attains an elevation of about 1200 feet above the sea. The whole island is covered with a thick forest of heavy timber-trees. Many of the pine-trees are from 180 to 220 feet high, and from 4 to 8 feet in diameter at some distance from the ground. Among these is the araucaria. [ARAUCARIA.] As the soil of the island is very fertile, a British settlement was formed in 1789, from Sydney in Australia; but although the grain sown produced abundant crops, and potatoes and other vegetables succeeded, and although the climate was very favourable to the health of the settlers, and the water good, it was abandoned some years afterwards on account of the difficulty of landing. The sea surrounding the island has a rocky bottom, and there is no good anchorage. A number of large rocks also lie scattered about close to the shore, on which a continual surf breaks with great violence. There are only three places at which boats can effect a landing, and at these only with certain winds, and never in gales, which are rather frequent. Sometimes no landing can be effected for weeks together, and vessels, being obliged to stand off, are in danger of being lost on the numerous reefs. Norfolk Island has lately been made a penal colony for convicts from New South Wales; and it now seems to be the intention of government to try there the experiment of an improved and beneficent system of convict discipline, which, while carrying out the punishment inflicted by the law, shall lead to reformation of the criminals. (Hunter's *Historical Journal of the Transactions at Port Jackson and Norfolk Island*, London, 1793.)

NORFOLK. [VIRGINIA.]

NORICUM, a province of the Roman empire, was bounded on the north by the Danube, on the west by Vindelicia and Rhætia, on the east by Pannonia, and on the south by Illyricum and Gallia Cisalpina. It was separated from Vindelicia by the Œnus (Inn), and from Gallia Cisalpina by the Alpes Carnicæ or Juliæ; but it is difficult to determine the boundaries between Noricum and Pannonia, as they differed at various times. Under the later times of the Roman empire, Mount Cetius and part of the river Murius (Mur) appear to have formed the boundaries. Noricum would thus correspond to the modern Styria, Carinthia, and Salzburg, and to part of Austria and Bavaria. A geographer who wrote in the reign of Constantius, the son of Constantine the Great, includes Germania, Rhætia, and the Ager Noricus in one province. (Bode's *Mythographi Vaticani*, vol. ii.) Noricum is not mentioned by name in the division of the Roman empire made by Augustus, but it may be included among the Eparchies of the Cæsar. (Strabo, p. 840.)

Noricum was divided into two nearly equal parts by a branch of the Alps, which was called the Alpes Noricæ. These mountains appear to have been inhabited from the earliest times by various tribes of Celtic origin, of whom the most celebrated were the Norici (whence the country obtained its name), a remnant of the Taurisci. Noricum was conquered by Augustus, but it is uncertain whether he reduced it into the form of a province. It appears to have been a province in the time of Claudius, who founded the colony Sabaria, which was afterwards included in Pannonia. (Plin., iii. 27.) It was under the government of a procurator. (Tac., *Hist.*, i. 11.) From the 'Notitia Imperii' we learn that Noricum was subsequently divided into two provinces, Noricum Ripense and Noricum Mediterraneum, which were separated from each other by the Alpes Noricæ. In the former of these a strong military force was always stationed, under the command of a dux.

In addition to the Norici, Noricum was inhabited in the west by the Sevaces, Alauni, and Ambisontii, and in the east by the Ambidravi or Ambidrani; but of these tribes we know scarcely anything except the names. Of the towns of Noricum the best known was Noreia, the capital of the Taurisci or Norici, which was besieged in the time of Cæsar by the powerful nation of the Boii. (Cæsar, *Bell. Gall.*, i. 5.) It was subsequently destroyed by the Romans. (Plin., *Hist. Nat.*, iii. 23.) The only other towns worthy of mention were, Juvanum (Salzburg), in the western part of the province, Boiodurum (Innstadt), at the junction of the Inn and Danube, and Ovilia, or Ovilaba, or Ovilava (Wels) south-east of Boiodurum, a Roman colony founded by Marcus Aurelius.

The iron of Noricum was in much request among the Romans (Pliny, *Hist. Nat.*, xxxiv. 41); and according to Polybius gold was formerly found in this province in great abundance (quoted by Strabo, iv., p. 208).

NORMA, the Rule, a constellation of Lacaille, situated between Scorpio and Lupus. Its principal stars are as follows:—

Character.	No. in Catalogue of (Piazzi) Lacaille, C.	No. in Catalogue of Astron. Society.	Magnitude.
α	92	1889	5
δ	242	1831	5
γ^2	1351	1862	5

NORMAL. This word (from *norma*) is generally used to mean a perpendicular drawn to the tangent line of a curve or the tangent plane of a surface. It formerly meant simply *perpendicular*. [TANGENT.]

NORMAN ARCHITECTURE. Some remarks upon this style have already been made in the article GOTHIC ARCHITECTURE, where it is spoken of as one of the local modifications of that generic style comprehended under the terms Romanesque, Lombardic, and even Byzantine, and of which the distinctive and characteristic feature is the

round-headed (rund-bogen styl) or semicircular arch. Being imported into this country immediately from Normandy at the time of the Conquest, it has obtained among us the epithet which it bears, and our examples of it are frequently further distinguished by that of *Anglo-Norman*. Between this and the earlier Anglo-Saxon some have endeavoured to draw a line, yet it is little more than an imaginary one, it being exceedingly doubtful whether any specimens of the latter are extant. Those examples which were assumed to be Anglo-Saxon are now admitted to be Norman; or if a doubt in favour of their genuineness remains, they merely prove that, instead of being a distinct style, the Anglo-Saxon itself was no more than an imitation of the mode of building then prevalent on the Continent—an offshoot of the same parent stock; for the distinctions endeavoured to be established between what has been called Anglo-Saxon and Anglo-Norman are not those of *style*, taking the term in its most comprehensive meaning, but of *mode of treatment;* the rudiments of both being alike, not only as regards the form of the arch, but nearly all other particulars, as far as buildings of one and the other class—supposing them to be distinct ones—have features in common: the differences are local and accidental; the architectonic principles and the taste as to a predilection for certain forms and details are the same.

The Anglo-Norman period of our architecture may be said to extend from the date of the Conquest to nearly the end of the following century, that is, to the close of the reign of Henry II., 1189; but there are very few buildings in this style throughout, though there are many which retain detached parts and features belonging to and some which mainly consist of it, more or less intermixed however with what is of later date and in different style. Besides which, some of the structures which may safely be received as genuine Norman, as far as mere dates go, furnish very little information as to the style itself, beyond what may be equally well or better ascertained from other specimens: they are so plain in themselves, and the few features which they do exhibit have so little remarkable in them, that what is chiefly to be learnt from such examples relates only to the mode of building employed, apart from architectural style, except as far as massiveness of construction and the absence of what constitutes design contribute towards character. Such is the case with respect to one entire class of buildings, namely, the castles of the Anglo-Norman period, which, however interesting they may be in other respects, offer comparatively little for study to the architect, as they seldom present to the eye more than enormous masses of masonry, where grandeur is produced by bulk alone, without deriving anything from the efforts of art.

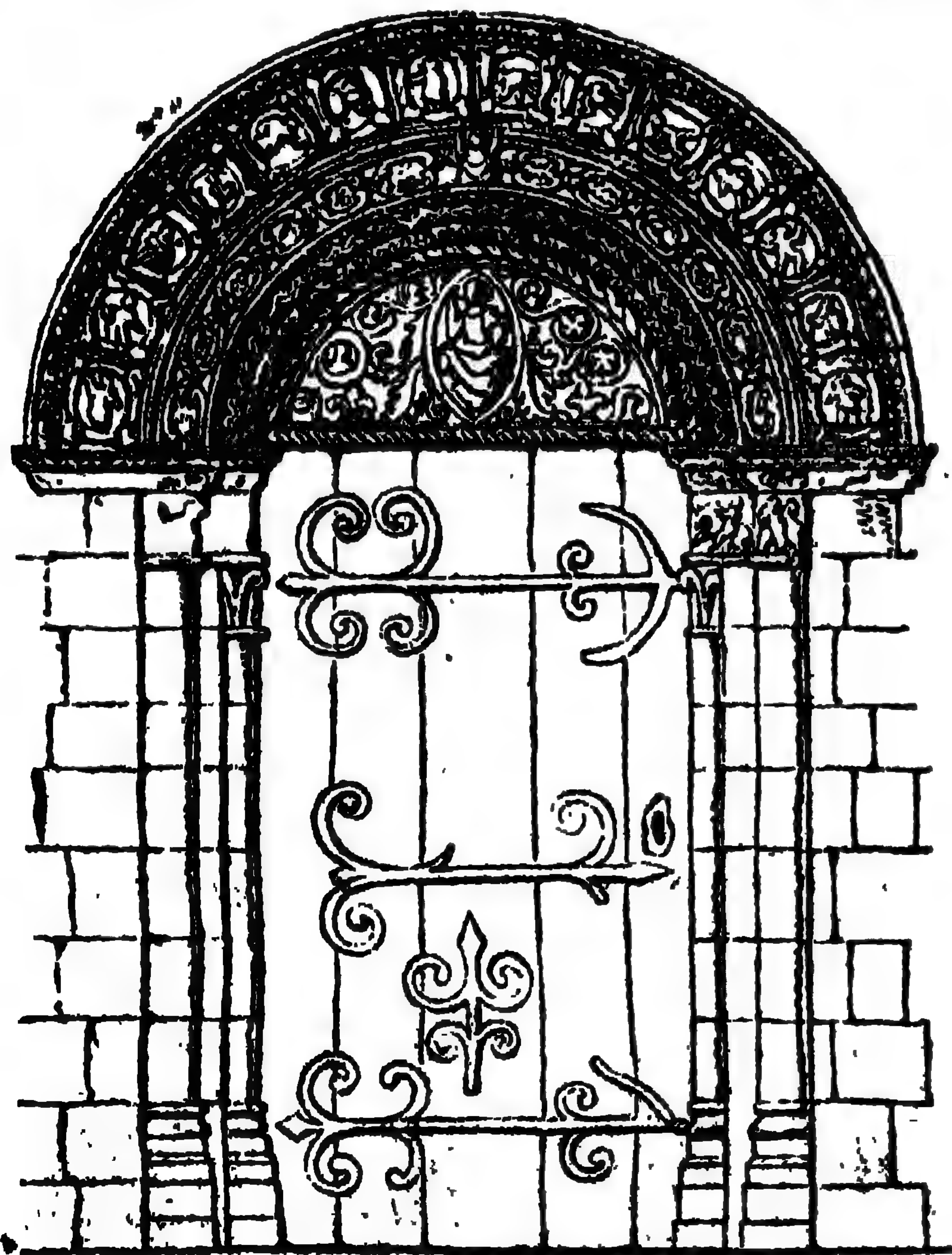
A great deal of Norman work is to be met with in the older parts of several of our cathedrals, and also in many smaller churches, such as Barfreston in Kent; New Shoreham, Sussex; Iffley, Oxfordshire; Steetly, Derbyshire, &c., which, having remained comparatively untouched, exhibit, although upon a limited scale, more of the Norman style and the peculiar mode of applying it than many larger edifices, notwithstanding that these latter occasionally present decorative features in this style which do not occur in buildings of a less pretending character. The older parts of Canterbury, Winchester, Gloucester, Ely, Durham, Norwich, Lincoln, and Oxford cathedrals are in this style. The nave and choir of Norwich in particular (founded in 1096), with the exception of pointed windows of later English character inserted in the upper part of the choir, are almost entirely Norman, of which they present a very fine example. Both that and the older portions of Gloucester are referred to by Hope as specimens of the Lombard style in England. It must be confessed however, that, putting aside the mere form of the arch and a few other individual parts, there is quite as much dissimilarity as resemblance between the Lombardic or round-arch style of Italy and that of this country. The combinations are almost altogether different. In England we have no instance of the low gable extending over a whole front, nor of sloping arcades beneath it [LOMBARDIC ARCHITECTURE, *cut*, p. 100], nor of tiers of small external galleries, nor of large circular windows as a principal feature in a façade, and still less of anything at all analogous to cupolas. Neither have we any examples of projecting doorways and porches resting upon richly sculptured columns, nor of ornamented pilaster-like shafts similar to that shown in the cut just referred to. Indeed we have very little remaining to show us the style of exterior composition employed by our Anglo-Norman architects in their larger edifices. The west fronts of Rochester and Lincoln cathedrals are almost the only parts that can be considered as specimens of Anglo-Norman architecture; yet each of them has many interpolations of other styles. The lower part of the former is entirely Norman, and has a remarkably fine though not very spacious centre doorway; but the large window over that entrance, in the later Gothic or perpendicular style, is so very prominent a feature, as greatly to take away from the effect that would else be produced by the other parts. The front of Lincoln presents little more than a surface decorated by small columns and arches, as is shown in the cut, p. 318, GOTHIC ARCHITECTURE. The general form, whose horizontal outline is broken only by a small gable of later date, is heavy, nor is there anything in common between this façade and those of the Lombardic churches. Wherever a superior degree of decoration was aimed at, the Anglo-Norman builders seem to have contented themselves with covering what would else have been blank surfaces with tiers of columns and arches of the kind referred to. The two transept towers of Exeter Cathedral, the front of Castle-Acre Priory, and of St. Botolph's Priory, Colchester, present little more; consequently, notwithstanding the variety as to detail, there is, as was also the case with Grecian architecture, a very great sameness as to general composition and design.

In the interiors of buildings this style exhibits itself more decidedly, owing not only to the perspective effect of a succession of spacious open arches, as in the naves of Norwich, Rochester, Chichester, Ely, and Peterborough cathedrals, but also to greater size and massiveness. Although such difference of character may at first appear somewhat incongruous, it being usual to find more minute and delicate forms employed for the internal parts of a building, the reason for it is evident; the tiers of pillars and arches on the exterior of Norman structures are merely decorations of the surface, while the arches and piers within are essential parts of the fabric. Instead of anything like lightness, we here meet with extraordinary massiveness, and sometimes uncouthness of proportions, arising from the excessive bulk of the piers from which arches spring: which character exhibits itself most strikingly when, as is the case with some of those in the nave of Norwich cathedral, the piers are merely short cylinders, with a kind of plain capital, and are not formed by shafts attached to a central mass of masonry. In the building just mentioned some piers of that description are ornamented on their surface by spiral grooves or flutings; and we may here remark that in that and other examples both cylindrical and clustered piers occur, not only in the same building, but in the very same part of it; and that great variety of detail and ornament is frequently observed in the mouldings of arches, columns or piers and their capitals, though they are uniform as to size, and compose a single range. Owing to the great diameter required for the supports of larger arches below, the mere pillar-shape was never employed for them, for although pillars of slender proportions were introduced for such purpose, it was only as *pier shafts*, or when the entire pier was made to consist apparently of a cluster of slender pillars, as some of those in the nave at Durham. It is true that slender detached pillars are of frequent occurrence, but then it is only to support small arches, as where a window is divided into or composed of two or more such arches, or in the triforia and other galleries within the building, where openings corresponding with the larger arches below are divided after the same fashion, and therefore do not form a continued arcade, but coupled or tripled arches at intervals, between the main piers. Sometimes the larger arches below, instead of being connected and resting upon the general capital of the pier, spring from *nook-shafts* or slender attached pillars, within the re-entering angles of the pier itself, the face of which was either left as a plain space dividing those pillars and the arches from the adjoining ones, or else decorated with another shaft carried quite up to the springing of the vault, and therefore very appropriately distinguished by Whewell by the term *vaulting-shafts*. Of the latter mode, the nave of the Abbaye aux Dames at Caen presents an example; while the Abbaye aux Hommes at the same place and the nave of Chichester give a combination of both; for there the loftier shaft does not fill up the space between the archivolts of the arches at their springings. But although attached pillars and shafts were almost uniformly of exceedingly tall and slender proportions, we occasionally meet with pillars short

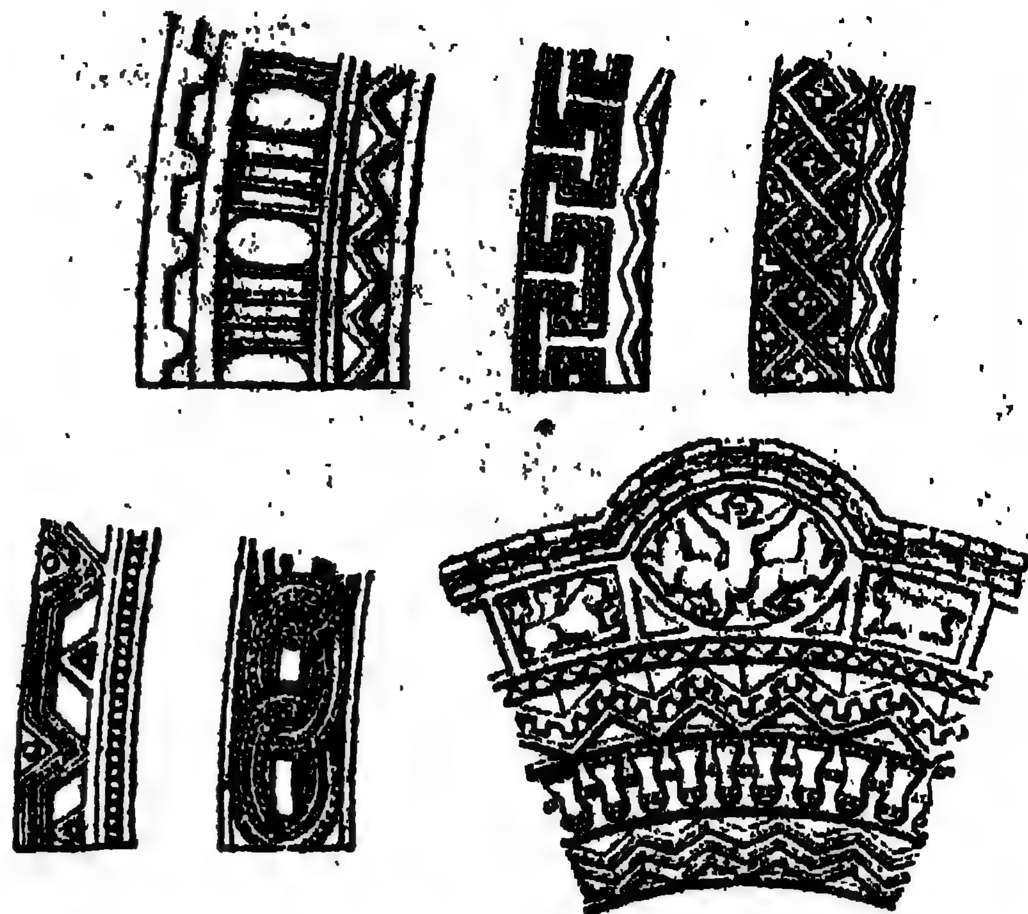
and stumpy and with bulky capitals, although the arches are very narrow, and the pillars themselves in situations where more delicate forms would have been sufficient. Of single columns approaching to the proportions of antient Roman columns, like those which are found in the Lombardic buildings of Italy, our Anglo-Norman structures afford scarcely an example, except it be in that part of Canterbury cathedral called Becket's Crown, where columns partaking very much of the Corinthian character, though somewhat bolder and more masculine, are employed as piers to support the arches (not round-head, but pointed); or they are rather coupled columns united back to back. Within crypts very short detached single columns were employed to support the arches of the vaulting, but this deviation from the usual practice would seem to have been occasioned merely by the local peculiarities of such subterraneous apartments, and consequently it can hardly be considered as characteristic of the style itself.

Having spoken of the style generally, we shall now briefly describe its principal component parts and separate features, which are not very numerous in themselves, although it would occupy some space and require a great number of explanatory cuts, if we were to attempt to notice the varieties of them, because few as are the general forms, and unvaried as is the general character, the diversity of detail and minutiæ is exceedingly great.

Doorways, even in small and otherwise plain buildings, and even when small in themselves, seem always to have had a great deal of embellishment bestowed upon them; and many have therefore been preserved in buildings, in every other part of which nearly all traces of the original Norman edifices have been obliterated by subsequent alterations. In many instances doorways are very deeply recessed, and in proportion to the aperture or door itself the dressings or decorations occupy a great space. This is likewise the case in the Gothic or pointed style; and it not only allowed great latitude in other respects, but enabled the architect to make what would else have been an insignificant feature, an important one in the design. A cut of the doorway at Romsey abbey is given at page 321 of Gothic Architecture, and we here introduce another specimen from Barfreston church, Kent, which, although small, is in some respects not only



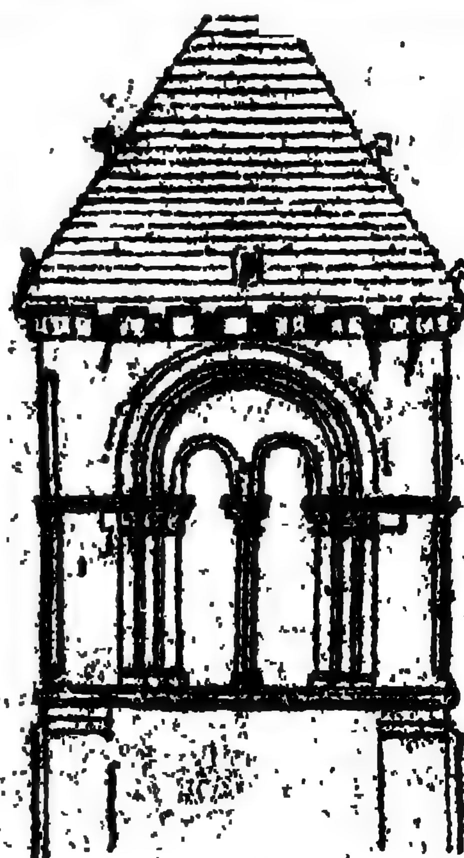
of a different but of a richer and more elegant character, and will serve as an example of a square-headed door, where the arched space above it is filled up with sculpture. In this example the archivolt mouldings extend on each side considerably beyond the general recess of the doorway; which was frequently but by no means invariably the case. The *chevron*, or zigzag moulding, was a very favourite ornament with the Normans, both for archivolts and other decorative mouldings; but that there were great varieties of such mouldings will appear from the following specimens.



Few as these examples are, they will convey some idea of the delicacy and even elegance of the ornamental detail employed in this style.

Windows had scarcely ever much decoration; they were generally small and placed at a considerable distance from each other; sometimes, too, merely plain apertures in the wall, and rarely more than scantily ornamented. At p. 201, Gothic Architecture, are two specimens of Norman windows, one consisting of a single opening, the other divided by a central pillar. In regard to such feature, the Norman and Gothic styles differ essentially, quite as much as if not more than they do in the mere form of their respective arches; for besides that windows are very secondary features in the one style, whereas they are among the principal and most characteristic features in the other, Norman windows have neither mullions nor transoms, nor any tracery or open compartments in head of the arch; for even where the aperture is divided into two smaller arches, resting upon a central pillar, the space or head between those arches and the larger one which includes them is never perforated or otherwise decorated. Hence the windows themselves were necessarily limited as to size: not but that it would have been very possible to increase the number of openings by means of additional pillars, and by afterwards perforating the general head of the window above the smaller arched divisions, although not with equal consistency as in Gothic architecture, where the mouldings of the mullions are continued upwards and form the ribs of the tracery, however complicate it may be. Sufficient hints for such purpose might have been found in some of the intersecting patterns of ornament which occur among the exterior enrichments of Norman buildings.

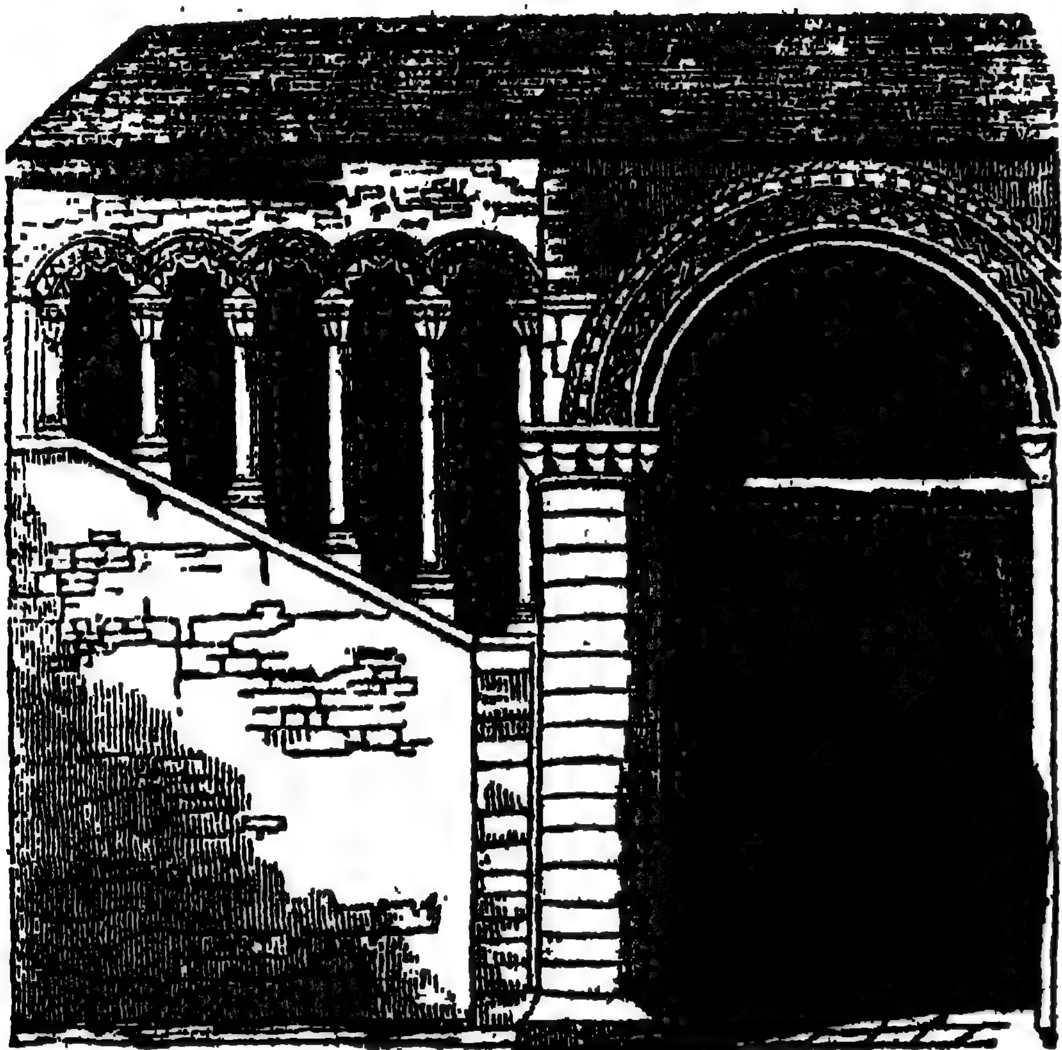
By way of showing how windows were occasionally made more important external features than usual, we subjoin a sketch of one in the upper part of the tower of Than Church in Normandy, where, although the apertures themselves



are narrow, the external breadth is rendered very considerable by means of the numerous pillars, or nook-shafts, on each side. Handsome in its general character, such form

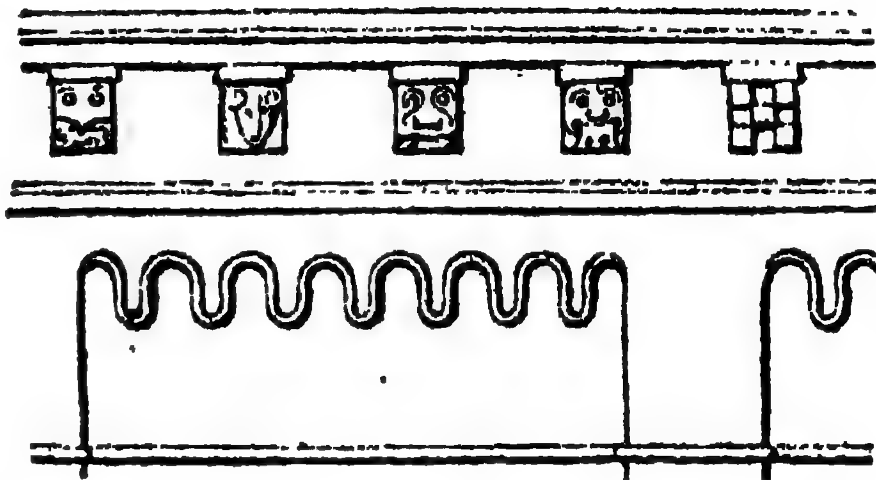
of window would admit of almost any degree of enrichment, by the mouldings being carved. In the story beneath it is a narrower window, with openings not half the breadth of the others, yet very nearly of the same height, and in other respects very different; but for that we must refer to the original plate, in Pugin's 'Architectural Antiquities of Normandy,' which comprises also a very interesting section of the whole tower. We may however call attention to the steep pyramidal stone roof, which form is supposed to have afterwards led to that of the spire, in like manner as its ornaments of animals' heads and figures may have suggested the first idea of crockets. Both triple windows, and window-like openings, in internal galleries, divided by two pillars into three arches, of which the middle one is wider and loftier than the others, also occur. There are also windows in this style which, though narrow, are of very considerable dimensions as to height, like those at the east end of Canterbury Cathedral.

As a very peculiar and interesting specimen of Anglo-Norman architecture, and for the purpose of showing how, by increasing the number of openings and pillars, windows might have been extended in this style, we here exhibit a sketch of an external staircase leading to the registry at Canterbury.



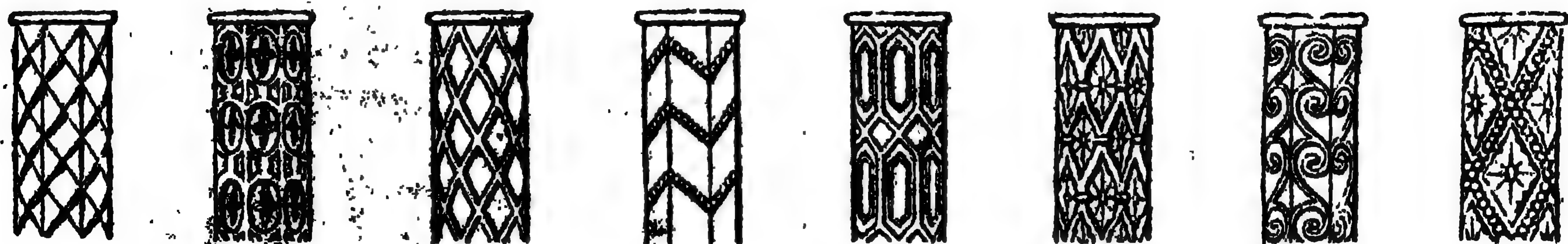
In this example there is somewhat to remind us of the open galleries of the Italian Lombardic, especially of those upon sloping lines beneath pediments [LOMBARDIC ARCHITECTURE, *cut*, p. 100], with this difference, that here the arches form a horizontal line. We have here also an instance of what was by no means uncommon in small arches in this style when they are not pierced through, which is, that the inner margin of the arches is formed by a chevron moulding which scallops them.

Buttresses, to which buildings in the Gothic style are indebted for so much of their character and effect, can hardly be said to exist in either Norman or Lombardic architecture. The enormous thickness of the walls and their solidity, owing to the smallness and infrequency of apertures in them, rendered such additional support unnecessary, even where the vaulting of the roof was large and bold. Hence nothing more than either *buttresses*, or *pilaster strips* (as they are conveniently termed by Mr. Whewell), were introduced, and these more for the sake of producing some variety and degree of expression than for actual strength, their projection beyond the general plane of the wall being very inconsiderable, and no more in fact than that of the corbelled parapet, or *corbel-table;* consequently buttress-strips do not so properly constitute projecting surfaces, as the intermediate spaces of wall form recessed compartments, or large pannels. The parapet itself was seldom more than a plain corbel-table, without battlement, except in castellated buildings; but sometimes, instead of forming a horizontal line, the lower edge of the corbel was what might be described as *embattled-reversed*, that is, indented like a range of battlements hanging downwards, or else made *wavy*, or scalloped with curves.

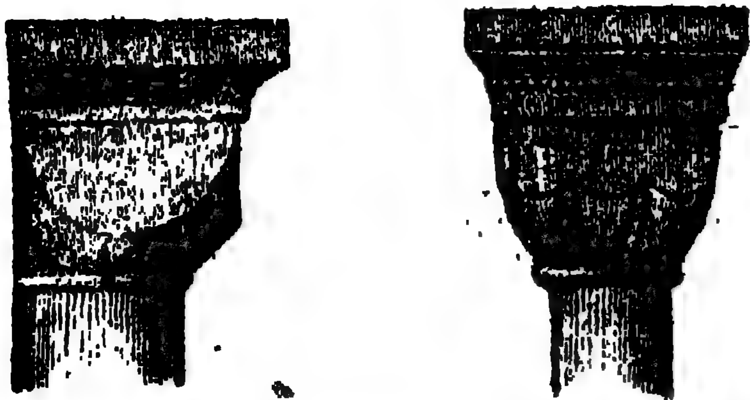


But the more common mode was to make the lower edge of the corbel table straight, with a series of corbel mouldings beneath it, frequently intersected by small blocks at intervals (after the manner of modillions), which were either left plain or sculptured with grotesque heads and figures. Occasionally again the corbelling assumed the form of a series of small interlacing arches, of which kind of decoration instances frequently occur in the Italian Lombardic.

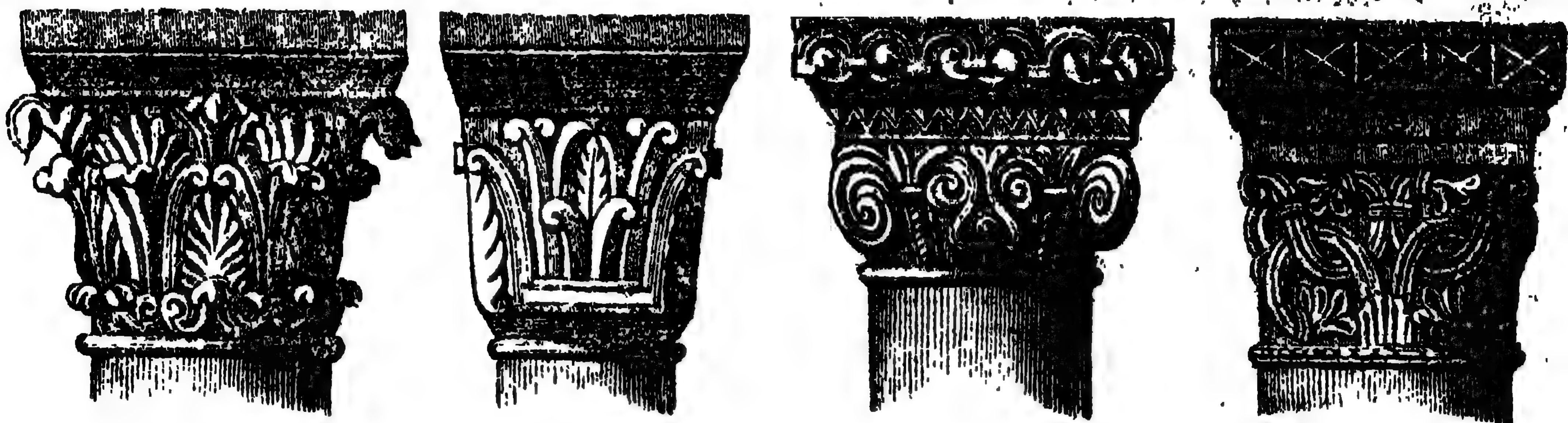
Pillars and *Columns*, with which the massive circular arch-piers, or piers with nook-shafts, are not to be confounded, exhibit great diversity of character, both as to proportions and decoration, from the rudest and plainest forms to either the lightest or the most enriched. Neither are the two terms to be regarded as precisely synonymous, it being as well to observe the distinction made between them by Whewell, and to restrict the latter term, which is also termed the *nebule* moulding, to such pillars as approach to the general proportions and character of classic columns, as is the case with those already mentioned as being in Becket's Crown, Canterbury. *Pillars*, on the contrary, have very great variety of proportions, either much below or greatly above such standard. The shafts are for the most part plain, though instances occur of their being carved (as was oftener than not the case with the columns of Lombardic porches); and in the undercroft at Canterbury Cathedral there are pillars whose shafts are fluted spirally. Raised mouldings, intersecting each other spirally so as to form a diamond-pattern on the surface, are by no means unfrequent; and some of the circular arch-piers in Durham cathedral are so ornamented: zigzag or chevron lines were also employed for decorating the surfaces of piers and columns, and were disposed either annularly, in horizontal rings, or spirally. Of these and some other varieties specimens are here shown.



With respect to capitals, the diversity is so great as to render it impossible, at least here, to attempt to classify them, or particularise even the leading varieties: while some are both rude and plain, others are remarkable for the delicacy of workmanship and the taste shown in their enrichments: some, though they do not lack ornament, are either too poor and insignificant, while others again, though quite plain, have something pleasing in their mass and contour, and in the proportion they bear to the height of the shafts. Of the plainer sort of capitals, the most common shape of those occurring in Anglo-Norman buildings is what Mr. Whewell designates the *Cushion Capital*, and which is formed by an inverted cone, of convex contour, spreading up towards the abacus, but intersected by four planes, producing as many flat surfaces or sides, answering to those of the abacus. This will be rendered more intelligible by the annexed examples from Rochester Cathedral, although they instance varieties of the cushion capital, the stem or circular part of each being cleft, whereby the planes or faces forming the sides become scalloped.



Of the variety of sculptured and enriched capitals, the four specimens here annexed do not go far towards conveying an adequate idea, nor are they the very best that are to be met with; nevertheless they may suffice. The first two are foreign, namely, from Jumieges and Sanson sur Rille; the others from St. Peter's, Northampton, and Steetly church, Derbyshire. The last of these is as remarkable for the Grecian character of the intertwining volutes carved upon it, as the first is for its striking general resemblance to the Corinthian capital. The one from Northampton has the least to recommend it, being a very uncouth composition. Besides those in our own cathedrals, a few other examples of sculptured capitals, more curious however than valuable as studies on account of the taste which they display, will be found



in Pugin's work already referred to; but there has been comparatively very little published to elucidate architecturally the subject of the Norman style.

Pier-Arches, that is, open arches resting upon piers, as those within churches, do not materially differ in design from those which ornament doorways, except that they are not so profusely decorated, and the archivolt mouldings do not occupy by any means so much space in proportion to the width of the opening. The arches themselves being uniformly circular (though in some few cases either somewhat more than a semicircle or prolonged perpendicularly to the impost), exhibit so far no variety; still, as regards the entire aperture, of which the arch itself forms the head, there is very great variety of character, according to the proportion which the heights of the supporting piers bear to the diameter of the arch, or opening between them. About twice the breadth appears to have been the average height of arches (*i.e.* openings) between piers; when much above that standard they may be called lofty (as the arches of the nave at Durham); and when much beneath it, they may be considered of low proportions. Besides the difference of character thus occasioned, much is also produced both by the form and proportions of the piers themselves. A circular or octagonal pier, for instance, appears much more massive than one composed of clustered shafts, &c., though the general diameter of the latter may be the same, or even somewhat more. Though we cannot pursue this point any further, we would recommend those who feel at all interested in the subject to make such comparisons for themselves; and they will doubtless find that they will be led on to make many others, and to enter into original investigations.

As the best way perhaps of impressing on the memory the leading characteristics of Norman architecture, we shall here briefly contrast them with those of the Gothic style:

Norman.	Gothic.
Round-headed arch.	Pointed arch, varying in proportions.
No tracery in windows.	Windows with mullions, transoms, and tracery.
Buttress-strips.	Buttresses rising in offsets or stages.
No pinnacles.	Pinnacles.
Battlements, doubtful if any.	Battlements in the ecclesiastical as well as military style.
Spires scarcely known.	Spires characteristic features.
Splayed surfaces of rare occurrence.	Splays for receding parts, universal.
Niches ditto.	Niches very general.
Windows generally small and few.	Windows spacious and numerous.
Horizontal lines and arrangements prevalent.	Vertical lines and arrangements.
Arch-piers very massive.	Arch-piers comparatively slender.
Vaulting simple and mostly plain.	Vaulting more complex and decorated.

Norman architecture, we may add, certainly contains many excellent rudiments and materials for a more finished style, and would no doubt have attained to greater consistency and variety, and increased in elegance and refinement, if the application of the pointed arch had not led to a system which completely superseded it. Still it is rather singular that, in an age when we confine ourselves to no one particular mode of building, but employ Grecian, Italian, Gothic, Tudor, Elizabethan, &c., as taste or circumstances may dictate, no attempt should have been made to revive this particular style. It is true that it presents no models for direct imitation, even for purposes of modern church architecture; it would require to be greatly modified; to have much supplied, in order to accommodate it to present usages; to be purified of much uncouthness; to be, in a word, remodelled: still, on that very account, does it recommend itself—not indeed to those who have no other guidance but precedents—but to those who are capable of entering into its spirit, able to discriminate between its valuable qualities and its defects, to treat it with originality, and to give free scope to their own inventive powers; just as Gärtner and some other modern German architects have formed a style of their own, taking for the basis of it one which may be considered the parent stock of both Lombardic and Norman, namely, the Byzantine, of which the round-headed arch constitutes a characteristic feature.

NORMANDIE, one of the provinces or military governments into which, before the French revolution, France was divided. It stretches along the coast of La Manche, or the English Channel, from near the mouth of the Somme, to the western side of the peninsula of Cotentin, which is included within it. It is bounded on the north and west sides by the sea, on the north-east by Picardie, on the east by the Ile de France, on the south-east by Perche, on the south by Maine, and on the south-west by Bretagne. It comprehended a number of subordinate divisions, which we give, adding the name and population of their chief towns, according to the census of 1831.

	La Haute Normandie, capital *Rouen*.	
Le Pays de Caux	Caudebec	2,832
Le Pays de Bray	Neufchâtel	3,430
Le Vexin Normand	Gisors	3,533
Le Roumois	Rouen	88,086
Le Pays de la Campagne	Evreux	9,963
	Breteuil la Guérande	—
Le Pays d'Ouche	Glos la Ferrière	—
Le Pays de Lieuvin	Lisieux	10,257
Le Pays d'Auge	Pont l'Evêque	2,118
	La Basse Normandie, capital *Caen*.	
La Campagne d'Alençon	Alençon	14,019
Le Pays d'Houlme	Domfront	1,873
La Campagne de Caen	Caen	39,140
Le Bessin	Bayeux	10,303
Le Bocage	Vire	8,043
Le Cotentin	Coutances	8,957
L'Avranchin	Avranches	7,269

Le Vexin Normand was so designated to distinguish it from that portion of Le Vexin which was in the early ages included in the domains of the crown, and entitled Le Vexin Français.

The population of the five departments into which Normandie has been divided, with the exception of the arrondissement of Mortagne in the department of Orne, which comprehends a portion of the county of Perche, was, in

1831, 2,520,018. The greatest length of the province, from north-east to south-west, from the neighbourhood of Eu on the Bresle to that of Pontorson on the Couesnon, is about 170 miles; the greatest breadth, at right angles to the length, from Cape La Hague or La Hogue, at the extremity of Le Cotentin, to the neighbourhood of Domfront, is 110 miles. The area may be estimated at about 11,100 or 11,200 square miles, giving 225 to 227 inhabitants to a square mile, a density of population far above the average of France. This area is nearly double that of Yorkshire.

A detailed description of the country is given under the departments into which it is now divided. [CALVADOS; EURE; MANCHE; ORNE; SEINE INFERIEURE.] Normandie contains no great elevations, except in the south, where it is traversed by the eastern prolongation of the Armorican chain of hills, and in the west, where a branch of that chain extends into the Cotentin. It is watered on the east side by the Seine and its tributaries the Eure and the Rille; in the centre by the Orne, Dives, and Toucques; and in the west by the Douve, Vire, Sée, and Celune. The climate is moist and temperate, and the soil produces abundantly all sorts of grain; apples and pears are grown in great quantity, from which are made cider and perry, the common drink of the peasantry, who grow no wine. The meadow and grass lands are extensive and excellent, and afford pasturage to numbers of cattle and horses. The tables of population given above will show that Normandie contains many important towns. Manufactures are common, especially of cotton; and along the coast are the ports of Dieppe, Le Hâvre, Honfleur, Isigny, Cherbourg (for the navy), and Granville.

The country which afterwards constituted the duchy of Normandie was, in the earliest period of Gallic history, inhabited by a number of Celtic nations. The Baiocasses, Viducasses, Lexovii, and Aulerci Eburovices inhabited the districts now chiefly comprehended in the departments of Calvados and Eure; and their territories comprehended the following Celtic or Roman towns:—Baiocasses—Arægenus, afterwards Baiocasses (Bayeux), and Grannona (Port-en-Bessin), on the coast near Arægenus; Viducasses—Viducasses (Vieux), near the Orne above Caen; Lexovii—Noviomagus, afterwards Lexovii (Lisieux), and Breviodurum (Pont Audemer) on the Rille; Aulerci Eburovices—Mediolanum, afterwards Eburovices (Evreux), Condate (Condé sur Iton) above Evreux, and Uggade (Pont de l'Arche) on the Seine. The other nations and towns are noticed elsewhere. [MANCHE; ORNE; SEINE INFERIEURE.] These nations were all included in the Roman province of Lugdunensis Secunda, which nearly coincided with the subsequently established duchy of Normandie, and of which Rotomagus (Rouen) was the capital. This part of Gaul was, on the downfal of the empire, conquered by Clovis (A.D. 497-500), and incorporated by him in the kingdom of the Franks. In the division of the Frankish territory among the sons of Clothaire I., it was included in the kingdom of Neustria, which comprehended the country between the Channel and the Loire, the middle of Champagne, and the frontier of Bretagne. On the etymology of the name Neustria scholars are not agreed: it seems to include the same element as our own word 'west' and the French 'ouest,' with the addition of the initial consonant.

In the attacks of the Northmen or Danes on France, Neustria had its share of the general devastation. Among the most formidable of their chieftains was Rollon or Rollo,* who first attacked France in A.D. 876: he ravaged alternately the north and the south of France, the Low Countries, and England; and in A.D. 911 he led a numerous army from the last-mentioned country to the siege of Paris. He extended his ravages in every direction; and though he experienced some reverses, and appears to have failed in his attempt upon Paris, he received, from the weakness or policy of Charles le Simple, king of France, the hand of his daughter Gisele or Giselle in marriage, with the cession of an extensive province, to be held as a fief, on condition of his ceasing to ravage the rest of the kingdom and making profession of the Christian religion. The ceded province was north of the Seine, and extended from the Epte to the sea; it became the duchy of Normandie, so called from the Northmen, or (to give them their more familiar designation) the Normans (in French, Normands), by whom it was possessed. A circumstance which occurred at the conference held for confirming the treaty is indicative of the situation and character of the parties. Rollo, having refused to kneel before the king and to kiss his feet in recognition of his sovereignty, commanded one of his soldiers to perform for him these acts of homage. The rude soldier, seizing the king's foot, handled it so roughly as to overturn him from his chair, amid shouts of laughter on the part of the Normans, and a prudent silence on the part of the king's French attendants. As the province had been utterly wasted by the ravages of the invaders, the counts of Dol and Rennes in Bretagne were pledged to furnish provisions to the new settlers; and the king ceded to Rollo his claims to the sovereignty of that part of Bretagne which had ceased to recognise the authority of the crown of France.

The conversion of the northern pirates into cultivators of the soil which they had previously ravaged, is one of the remarkable historical features of the dark period which succeeded the downfal of the Western empire, and in no instance was the change more striking and more complete than in the case now before us. Much is doubtless to be ascribed to the personal character of Rollo, who appears to have possessed qualifications far beyond those of an ordinary sea-king. He introduced the feudal system in a completeness and regularity to which it had not attained in those parts where it had been the growth of many years and of various circumstances. The first fiefs granted by him were to some of the churches of his duchy, the rest of which he divided into counties and distributed among the chief officers of his army. The Normans applied themselves with energy to the cultivation of the ravaged lands; strangers from all parts were invited to settle within the duchy, and so severely and successfully were the laws administered for the protection of property, that it is said that a bracelet which Rollo suspended from an oak in a forest near the Seine remained untouched for three years. The anecdote may be apocryphal, but it shows the opinion entertained of the efficiency of his police. He rebuilt the ruined churches and took every precaution for the defence of his territories against the attacks of other pirates, enclosing the towns with walls, securing the mouths of the rivers by barricades, and keeping up the valour and warlike skill of his subjects by hostilities along his frontier, especially against the Bretons, whom he reduced to subjection.

The number of warriors whom Rollo established in his new settlement is calculated, by M. Simonde de Sismondi (*Hist. des Français*, pte. ii., c. xiii.), at not more than 30,000, but the energy which this admixture of a new and warlike population infused into the degenerate population of France rendered their establishment an event of great importance. They effected few external changes; they adopted the language, the social and political institutions, and the religion of the nation which they had conquered; but they imparted to each that vigour which was the characteristic of their own nation. The rude dialect, formed by a corruption of the Latin language, which was then common in France, became in their hands a regular and a written language, embodied in their judicial code or in the poetry and romance which constituted their popular literature. The feudal system received from them, as already noticed, its most complete and regular form; and acquired a stability which rendered it an important instrument in the restoration of social order in Europe. Their attention to the sermons and the scholastic and catechetical instructions of the clergy was marked by the same assiduity which characterised their other pursuits; and the faith of their Scandinavian fathers was abandoned for the profession of Christianity, of which the churches and the priests had been, during their piratical career, the objects of their bitterest hostility.

Some years after the establishment of the duchy, a new invasion of France by the piratical Northmen took place (A.D. 923-927), and the invaders, when defeated, found shelter and assistance among the subjects of Rollo, by whose support they were enabled to renew their ravages. The cession of Le Bessin, or the territory of Bayeux, and of a portion of Maine, bought off the duke of Normandie, and the pirates, left to their own resources, were almost entirely destroyed in a battle near Limoges.

Rollo abdicated his duchy (A.D. 927) in favour of his son. An antient writer has recorded the form of words used by him: 'C'est a moi de mettre mon fils à ma place, et à vous de lui garder fidelité.' The time of his death is not clearly ascertained; he lived certainly one year, perhaps five years after his abdication.

* His name is variously written—Rolf, Rou, Raoul, or Hrolf. He is also called Robert.

Guillaume (William) I., called Longue Epée (long-sword), was the successor of Rollo. He contracted alliances by marriage with some of the most powerful of the French nobles, and gained several advantages over the Breton chiefs who opposed him. He received from Raoul or Rodolphe, king of France, the cession of Le Cotentin and L'Avranchin, which he added to his dominions. He had a principal share in the restoration of Louis IV. d'Outre-mer to the throne of France; but in the civil dissensions of France, he forsook his party for that of Otton or Otho the Great of Germany, rival of Louis. He returned however to his allegiance (A.D. 942) after a time, and was reconciled to the king. He afforded an asylum to Harold or Harald VII., king of Denmark, whom he restored by an armed force to his throne. Guillaume was assassinated by the attendants of Arnolphe, count of Flanders, at a conference which he held with that noble at Pecquigny on the Somme (A.D. 942), just as he was on the point of abdicating his duchy to assume the habit and vows of a monk.

The assassination of Guillaume brought the duchy into great peril. He left no legitimate offspring, but his natural son Richard I., afterwards called *Sans-peur* (the fearless), a boy of ten years, was recognised as duke by the Normans, and placed by them under the care of three or four guardians, of whom two at least were recent emigrants from Denmark, and had not renounced paganism. Louis IV. d'Outre-mer, king of France, hastened to Rouen (A.D. 943) and secured the person of the young duke, whom the Normans, not without some distrust, allowed him to convey to Laon, that he might be there brought up in a manner befitting his rank and prospects. Hugues, duke of France and count of Paris, also interfered in the affairs of the duchy, and both he and Louis justified their intervention by urging the necessity of excluding the pagan guardians, and diminishing their influence and that of the other adventurers who had arrived, during the ducal reign of Guillaume, from the north. A period of general dissension ensued, and the warfare assumed a partially religious character. Louis of France, involved in a harassing contest with his vassals, and especially with Hugues, sought to make up his quarrel with the latter by an agreement for the partition of Normandie; and these two, uniting their forces, attacked the duchy one side, while it was assailed on the other by the Bretons, who gladly seized so favourable an opportunity of throwing off the Norman yoke. The address and perseverance of Bernard the Dane, regent of Normandie, triumphed over these difficulties. He drew off Louis from his agreement with Hugues, and called in Harold, or Aigrold, king of Denmark, to the support of Richard, who had been delivered from his virtual captivity at Laon by an adroit stratagem (A.D. 944). Louis was shortly afterwards (A.D. 945) seized and detained captive at Rouen by Bernard, in consequence of an affray between his attendants and those of Harold, and obtained his release, on conditions highly favourable to the Normans, only to pass into another captivity in the hands of Hugues of Paris, by whose intervention the Normans had let him go. He remained a year in this second captivity, and his release (A.D. 946) was soon followed by a renewal of the war, in which Richard and Hugues were in alliance against Louis and his supporters. In this warfare Richard grew up, signalising his courage and obtaining thereby his distinguishing epithet of Sans-peur. Louis (A.D. 954) and Hugues (A.D. 956) died leaving their children minors; and the obscure annals of the following years present little worthy of notice.

In the reign of Lothaire, son and successor of Louis IV., new attempts, either by treachery or force, were made on the person and dominions of Richard (A.D. 963), who resorted for assistance to the king of Denmark and obtained the support of an auxiliary force. By the ravages of this barbarous soldiery the king and his chief adviser, Thibaut, count of Chartres, were obliged to sue for peace. On the death of Louis V., successor of Lothaire, Richard was one of the most energetic and influential supporters of Hugues Capet, in his acceptance or perhaps usurpation of the throne of France (A.D. 987). Richard died at Fécamp (A.D. 996), after a reign of fifty-three years, in which he had displayed the qualities which then ranked highest in public esteem.

The early part of the reign of Richard II., surnamed *Le Bon*, was distinguished by an event little noticed in history, but presenting one of the most remarkable phenomena of the period. The peasantry of Normandie, consisting of the descendants of Romanised Gauls and Franks, of those who had been reduced to or retained in an inferior condition by the settlement of the Northmen under Rollo, and of those who had subsequently emigrated from other parts of France, determined on claiming an equality of privilege and station with their northern conquerors. In this resolution indeed nothing more is discernible than the impatience of degradation and wrong, and the sentiment of national independence, which distinguished other popular outbreaks of this and subsequent periods. The singularity of the proceeding consists in the deliberation and caution with which it was conducted.

Secret assemblies were held in each county of the duchy, and two deputies were appointed by each to meet in a general assembly in a central place, to maintain their pretensions to perfect equality with the dominant race. The plan was however discovered. A band of soldiers, despatched by the duke, surprised the general assembly at its sitting, seized the deputies and others of the peasantry, and causing them to be mutilated by cutting off their hands and feet, sent them home to strike general terror. The design was abandoned, and the peasantry resigned themselves to a servitude against which they deemed it in vain to struggle (A.D. 997).

The reign of Richard II. is also remarkable for the first establishment of a connection between the affairs of Normandie and England, then governed by Ethelred II., the weakest prince of the Anglo-Saxon dynasty. The first incident which brought the countries into contact was the marriage of Ethelred with Emma, the sister of Duke Richard (A.D. 1002). In the following year hostilities appear to have broken out between the two powers, and a force, landed from an English fleet, was repulsed in an attempt to ravage the duchy. At a subsequent period Ethelred, when attacked by Sweyn, king of Denmark, and abandoned by his subjects, took refuge in Normandie (A.D. 1013-14); until recalled by his subjects. On his death, his wife Emma and her children returned to Normandie, and remained under the care of Richard, who however took no active measures for asserting the claim of his nephews against the Danes. Emma herself married Canute the Dane, the usurper of her children's inheritance.

Another remarkable event marked this reign. Rodolph, a Norman chieftain, who had some complaint against Richard, proceeded with many companions to Rome, in the double character of a pilgrim and an appellant to the authority or influence of the pope (A.D. 1016). By the advice of the pontiff he engaged in the service of the Lombard princes of Benevento, and attacked the Greeks of Apulia, which country was then subject to the emperors of Constantinople. Many young Normans, encouraged by Duke Richard, engaged in the service of Rodolph; and this expedition, in the course of a century, led to the establishment of a Norman dynasty on the throne of the two Sicilies. [SICILIES, KINGDOM OF.]

In the internal dissensions of France, Richard II. was commonly the faithful supporter of King Robert, who had succeeded his father, Hugues Capet. He was engaged in various struggles with the other powerful nobles of that kingdom; in his contest with Eudes II., count of Champagne and Blois (A.D. 1016-23), he scrupled not to summon to his aid the savage hosts of Norway and Sweden, and the terror caused by the arrival of these allies led to an accommodation.

On the death of Richard II. (A.D. 1026 or 1027), his eldest son Richard III. succeeded to the throne. Soon after his accession he had a war with his brother Robert, who had inherited a district of the duchy in subordination to the duke. He obliged him to submit; but, immediately on his return to Rouen, he died under circumstances which led to a strong suspicion of poison; and the vacant duchy was seized by Robert, whose character and exploits obtained for him the twofold epithet of *Le Magnifique* (the magnificent) and *Le Diable* (the Devil). He had to struggle against the rebellion of his vassals, who were encouraged to resist him by the odium which attached to him as the reputed murderer of his brother and lord. But he triumphed over these opponents, and became the arbiter of the disputes among his neighbours, restoring Baudouin or Baldwin of Flanders to his country (A.D. 1030), and enabling (A.D. 1031) Henri I. to mount the throne of France in spite of the opposition of Constance, the queen-mother, and her younger son Robert, duke of Bourgogne. Henri, in return for his powerful support, ceded to him as a fief the district between the Epte

and the Oise (*Le Vexin Français*). In 1034 Robert equipped a fleet for an expedition to England, in order to restore Alfred and Edward (afterwards the Confessor), the children of Ethelred II. by Emma, to the throne of their ancestors, then usurped and occupied by Canute the Dane. The fleet was however driven back by a tempest, and Robert, changing the direction of the force he had gathered, sent it into Bretagne, and compelled Alain or Alan, who then held that duchy, to do homage to him. Robert shortly afterwards set out on a pilgrimage to the Holy Land, after having recommended his only son William the Bastard, a boy of eight years, to the fidelity of his nobles; and died at Nicæa in Bithynia, A.D. 1035.

Guillaume (William) II., known at first, from the illegitimacy of his birth, by the surname of 'the Bastard,' afterwards, from his acquisition of England, by the more respectful designation of 'the Conqueror,' had been, before his father's departure, taken to the court of Henri I. of France, and entrusted to his care. On the death of Robert, Henri took his young ward to Rouen, and established him in possession of his father's dominions, except Le Vexin Français, which in the time of his own difficulties he had given to Robert as the price of his aid, and which he now retained.

The tender age of the young duke, and the stain attaching to his birth, encouraged several of the chieftains of Normandie to dispute his claim or to rebel against his authority. Guido, or Gui, count of Macon, grandson, by his mother, of the duke Richard II., was his most formidable competitor; and the Norman nobles, embracing one side or the other, and seizing the opportunity of civil discord for revenging their private quarrels, fortified their castles, and spread the flames of war throughout the duchy. The desolation caused by these and similar feuds, not only in Normandie, but in all parts of France, led the clergy to attempt the establishment of 'the peace of God,' which would have caused the almost entire cessation of private war. The attempt was too much at variance with the state of society and the spirit of the age to be effectual; but when the priesthood, instructed by experience, set themselves to limit and regulate an evil which they could not suppress—when, under the title of 'the truce of God,' they secured certain periods of time, and portions of territory, and classes of persons, from the violence of warfare, their benevolent aim was more successful. The confusion and troubles of Normandie continued however during the minority of Guillaume, whose courage, steadfastness, and vindictive character, were developed and strengthened by the scenes amid which he grew up. His ducal rank was preserved during his minority, rather by the mutual jealousies of his subjects than by his own power; but as he approached manhood he was enabled to maintain his authority; and in a victory, obtained at Val des Dunes, between Caen and Argentan (A.D. 1047), he crushed his most formidable competitor, Guido of Macon, who was supported by nearly the whole body of Norman nobles. Henry I. of France was present at this battle, with an auxiliary force of 3000 men, on the side of Guillaume.

By the consequences of this victory, and of subsequent advantages which he obtained over other assailants, Geoffroy Martel, count of Anjou (A.D 1048), and Guillaume, count of Arques, an illegitimate son of Richard II. (A.D. 1054), the power of Guillaume was so far consolidated as to lead him to extend his ambitious views to foreign lands, and especially to the British Islands.

When Ethelred II., king of the Anglo-Saxons, died, his wife and children returned to Normandie, where the latter grew up, and remained until one of them was invited into England, where he was murdered, and the survivor, Edward the Confessor, was elevated (A.D. 1042) by the nobles and clergy of England, under the influence of Godwin, to the now vacant throne of that kingdom. Edward was in manners, language, and affections a Norman rather than a Saxon; and his reign of twenty-three years (A.D. 1042-1066) was chiefly occupied by a struggle between the Normans, with whom the king had surrounded himself, and the Anglo-Saxon or native party under Earl Godwin and his sons. [HAROLD II.] This predilection of Edward for his Norman relatives and friends encouraged the ambition of Guillaume, who visited England with a large retinue, or even armament, at the time of the predominance of the Norman party. 'As he journeyed through the land of the English,' says a modern writer, 'the Duke of Normandie might have believed for a moment that he was still in his own territories. The fleet which he found at Dover was commanded by Normans; and at Canterbury some Norman soldiers composed the garrison of a fort built on the declivity of a hill. Crowds of Normans came to salute him in the dress of captains or prelates. Edward's favourites came to pay their respects to the chief of their native country; and, to use the language of that day, thronged round their natural lord. William appeared in England more like a king than Edward himself; and it was not long before his ambitious mind conceived the hope of becoming so without difficulty at the death of this man, whom he found a slave to Norman influence.' (Thierry, *Conquête d'Angleterre*, liv iii.) The fluctuations of the struggle between the parties at the English court do not belong to our present subject; and the events which led to the accession of Guillaume to the English throne are described elsewhere. [HAROLD II.]

Henri I. of France had supported the count of Arques against Guillaume, and he subsequently (A.D. 1058) attacked Normandie, but without success. A peace was concluded next year, and continued for the remainder of the reign of Henri, and a portion of the reign of his successor Philippe I. During the troubles of Anjou, the succession of which was disputed, and while Bretagne was torn by internal dissensions, Guillaume seized his opportunity, and wrested the suzerainty of Maine from the rival counts of Anjou. He also carried on war with the Bretons, over whom he gained some advantages (A.D. 1065) a year before his expedition to England. He set sail for the conquest of England from St. Valery-sur-Somme on Michaelmas-day, A.D. 1066.

A revolt of the people of Le Mans, who afterwards submitted (A.D. 1068-1070), is among the indications of the rising spirit and importance of the inhabitants of towns; and led, though unsuccessful in its immediate object, to the formation of municipalities in most parts of France. Troubles of greater extent followed. Guillaume had, soon after the conquest of England, during a fit of illness, designated his eldest son Robert as his successor in the duchy, and caused the Norman grandees to do homage to him as their duke; but on his recovery, he had not only refused to deliver over to Robert the government of the duchy, but withheld from him the county of Maine, which had been granted to him as his wife's dowry. According to other accounts, William, on setting out for the conquest of England, had engaged to Philip, king of France, in order to obtain his consent to the enterprise, that he would, if successful, resign his continental dominions to Robert. (*L'Art de vérifier les Dates.*) These and other wrongs, real or imagined, drove Robert into exile, and led him to make incursions into Normandie, which were repressed by Guillaume. In 1087 Guillaume demanded of Philippe I. of France the restitution of Le Vexin Français, which had been withheld from him by Henri I. Philippe refused: war ensued, and an accident which occurred in the course of it led to the death of Guillaume, after he had governed the duchy of Normandie fifty-two years.

On the death of Guillaume, Robert became duke of Normandie, and returning from exile, took possession of his inheritance. He made a vain attempt, by means of his partisans, to possess himself of England, which had fallen to the share of his next brother Guillaume le Roux, or William Rufus or the Red (A.D. 1088). The misconduct of Robert, and the intrigues of his brothers, excited general discontent in Normandie. In the universal confusion, the people of Le Mans and the county of Maine again revolted; and the citizens of Rouen, of the party of Guillaume, introduced a body of the troops of that king within their walls. The citizens and their auxiliaries were however defeated by Henri, count of Coutances and Avranches (afterwards Henry I. of England), the youngest of the Conqueror's sons, who, on this occasion, supported Robert (A.D. 1090). Guillaume soon after landed in Normandie; and he and Robert made up their quarrel, and uniting their forces, deprived Henri of his two counties and drove him into exile (A.D. 1091). They divided his lands between them, and Guillaume returned home. The weakness of Robert encouraged the licentious violence of his barons, and Normandie continued to be the scene of confusion; until the duke, eager to engage in the first crusade, pledged his dominions to his brother the king of England for a sum of money, and embarked for the Holy Land (A.D. 1096). Guillaume, thus possessor of the duchy, renewed the contest with Philippe for the possession of Le Vexin Français, and sought to recover Maine, but his projects were cut short by death (A.D. 1100)

The death of William and the absence of Robert gave opportunity to Henri to seize the throne of England; but his hands were too full to allow him to make any attempt on Normandie, which quietly submitted to the dominion of Robert on his return (A.D. 1101) from the crusade. In 1102, at the invitation of his partisans, Robert landed in England to dispute the crown of that kingdom; but seeing little hope of success, came to an agreement with his brother, and returned. The political necessities of Henri obliged him to leave Robert for a time in possession of Normandie, which, under his weak sway, was torn by anarchy and dissension; but as Henri gained stability, he began his encroachments on his brother, whom (A.D. 1106) he assailed with an army of Anglo-Normans. The discontent of Robert's subjects favoured his designs: he took Bayeux after a stout resistance, and burned it, and Caen surrendered; but Falaise and Tinchebray resisted. The two brothers engaged in conflict under the walls of the last-named town; Robert was defeated and taken, and an English army conquered Normandie, as, forty years before, a Norman army had conquered England. Robert died, after a long captivity, A.D. 1134. [HENRY I.]

Henri governed with vigour the country which he had unjustly acquired. He put a stop to internal warfare, resumed or compelled the restoration of many grants made by his brother, restored to the Church the possessions that in a time of discord had been wrested from it, and regained possession of all that had belonged to his father. His attempts to possess himself of the person of Guillaume, son and heir of Robert, who took refuge in France, led to mutual jealousy and distrust between him and Louis VI. *Le Gros*, king of France. The counts of Flanders and Anjou allied themselves with Louis, and war broke out (A.D. 1108), and continued for two years. After a short cessation it broke out again (A.D. 1111), and the discontent of some Norman lords added to the difficulties of Henri; but he managed to draw the count of Anjou over to his side: the count of Flanders was dead, and he forced Louis to conclude a disadvantageous peace (A.D. 1114).

Guillaume, the son of Robert, was now of age; and compassion for his lot and that of his captive father, and dislike to the stern government of Henri, had disposed the Norman lords to revolt. Louis and the young count of Flanders embraced the party of Guillaume, and attacked Normandie, but without success (A.D. 1117). The count of Anjou having joined their party, they renewed their attack; the Norman lords revolted (A.D. 1118), and Henri seemed on the point of losing the duchy; but a succession of favourable events enabled him to regain the superiority, and by the mediation of the pope, Calixtus II., peace was restored (A.D. 1119). New discontents and troubles broke out after the death of Guillaume, the only legitimate son of Henri, who was drowned in his passage from Normandie to England (A.D. 1120). It is likely that these discontents were caused or augmented by the fear that Normandie and England would become mere provinces of Germany by the marriage of Maud, or Mathilde, daughter and heiress of Henri, with the emperor of Germany, Henri V., which had taken place A.D. 1114, when the princess was only ten years old. The king of England however obtained the recognition of his daughter as heiress to England and Normandie, and after the death of her husband the emperor (A.D. 1125) married her A.D. 1129, notwithstanding the repugnance of his nobles, and of Maud herself, to the son of the count of Anjou, Geoffroi Plantagenet, who succeeded, by the abdication of his father, to the county of Anjou and its dependencies, in the same year in which the marriage was celebrated.

The death of Guillaume, son of Duke Robert, and claimant of Normandie (A.D. 1128), seemed to secure the great object of Henri's cares, the quiet succession of his daughter. But notwithstanding this favourable event, his latter days were embittered by the quarrels of himself and his daughter with Geoffroi of Anjou; and on his death (A.D. 1135), his cares were frustrated by the usurpation of his nephew Etienne, or Stephen, count of Boulogne. Usurpation led to civil war, and both England and Normandie suffered from a long series of hostilities, and from the consequent social disorganization. Geoffroi and his allies, with a powerful army (A.D. 1136), entered the duchy, which was almost defenceless; but the cruelty of his ravages provoked the hostility of the people, who were disposed to recognise him; and the resistance of the peasantry, and a wound which he received, led to his retreat. Etienne passed over from England to Normandie (A.D. 1137), and did homage to Louis VI. for that duchy; but he too displeased his subjects and returned to England, and the duchy remained without a master until A.D. 1144, when it was conquered by Geoffroi, who, in his turn, did homage for it to the king of France, now Louis VII., and Maud exercised a government little more than nominal until A.D. 1151, when Geoffroi died, and was succeeded in his Anjevin and Norman states by his son Henri, afterwards Henry II. of England.

Henri had indeed been invested with the rights of his parents over Normandie before Geoffroi's death (A.D. 1150), and the recognition of his investiture by the king of France had been purchased by the cession of Le Vexin Normand. In A.D. 1152 he married Eléonore, duchess of Aquitaine from whom Louis VII. of France had just been divorced. This union, by uniting under one chieftain Normandie, Anjou, and Aquitaine, rendered his power superior to that of the king of France: he managed to break up a hostile league formed against him, restored to his domain many fiefs which his father had alienated, repressed a rebellion of the barons of Aquitaine, and, in 1154, raised his greatness to its acmé by his succession, on the death of Etienne, or Stephen, to the crown of England. His right to Anjou was disputed by his younger brother Geoffroi, on the ground that his father had bequeathed it to him. This was true, and Henri had sworn to execute his father's will; but the pope absolved him from the obligation of his oath: the king of France, who had undertaken Geoffroi's cause, was won over by his address; and the defrauded prince was obliged to content himself with lands unfortified and a pension from his brother (A.D. 1156).

The talent and ambition of Henri, his extensive plans of aggrandisement, his struggles with Louis VII. of France, and his memorable contest with Becket, are recorded in another place. [HENRY II.] The history of Normandie is involved in that of the sovereign. In 1168 Henri invested his eldest son (also called Henri) with the duchy, but did not admit him to the administration of the government; and this constituted one of the grievances alleged by the young prince to justify his subsequent rebellion. Louis VII. of France, who supported him, besieged Rouen, which, by a gross breach of faith, he was on the point of taking (A.D. 1174). The arrival of Henri with a strong body of Brabançons, or mercenaries (whose employment was gradually preparing the downfal of the feudal system), compelled him to raise the siege, and peace was soon after restored. Henri died in 1189, worn out and broken-hearted by the ingratitude and perpetual rebellions of his children. His eldest and third sons, Henri and Geoffroi, had preceded him to the tomb.

Richard Cœur-de-Lion or the Lion-hearted succeeded his father in Normandie as well as in England. He had, before his father's death, and while in rebellion against him, done homage to Philippe II. Auguste, king of France, for the duchy and all the other fiefs possessed by his father in France. He was crowned as duke of Normandie after his father's death and before his own departure on the third crusade. [RICHARD I.] During his captivity in Germany the duchy was attacked by the king of France, who took several towns, but failed in his attempt on Rouen (A.D. 1193). The treachery of Prince Jean or John, Richard's brother, afforded him a fair prospect of wresting the duchy from its rightful owner; but the release of Richard and the double treachery of Jean frustrated his plans, and a petty yet destructive war followed, which, though interrupted by a short peace between the two kings, and by some subsequent temporary suspensions of arms, continued till the death of Richard (A.D. 1199), an event which happened in the course of an obscure struggle, but which led to consequences of the most important character, especially to Normandie.

The duchy of Normandie was now fast approaching the term of its existence. The conquests and other acquisitions made by its rulers had in reality impoverished and weakened it. The energies of William the Conqueror were, after his invasion of England, directed to the confirmation of his successful dominion over that kingdom. The weak and unsteady rule of Robert, his eldest son, prevented a separation which might have protracted the power and the existence of the duchy, and threw the government into the hands of Henri I., who entertained a jealousy of the native Normans, and limited his favour and confidence to Anglo-Norman and Breton chieftains. The extension of the domains of Henri II. divided his attention and provoked [illegible]

jealousy of his ambition and power; and Richard had wasted his strength in the crusades, and in a petty warfare with the king of France. But the energy which marked the character of these Anglo-Norman princes protracted the downfal of a power which seemed to threaten the independence of the rest of France, and which downfal immediately followed the acquisition of the sovereignty by a weak hand.

The dominions of Richard passed into the hands of Jean, or John, his youngest brother; but his claim was disputed by Artur, or Arthur, duke of Bretagne, son of Geoffroi, the third son of Henry II. There can be no doubt of the superiority of Artur's claim; but his tender years prevented his availing himself of it; and Jean, who showed more vigour and address in his usurpation than at any other period of his life, established his power with little difficulty (A.D. 1199). Philippe however embraced the cause of Artur, and though he abandoned it for awhile in a treaty with Jean (A.D. 1200), took it up again in a subsequent quarrel which he had with that prince. The capture of Artur (A.D. 1202), and his subsequent assassination by Jean at Rouen (A.D. 1203), put an end to the struggle. The crime however cost Jean his duchy; general indignation was excited by it: Philippe overran the duchy and took the strongest fortresses, not indeed without a brave resistance. Jean fled to England, and his subjects, abandoned by their prince, hastened to submit to the invader. Rouen was the last town to capitulate, and Normandie passed finally into the hands of the French king. Philippe accused Jean before the peers of France of the murder of Artur; and though such a tribunal had no cognizance of other crimes than those committed by a vassal against his suzerain, procured a sentence of forfeiture against him, by virtue of which the duchy was ever after united to the crown of France, though the legal act reuniting it in perpetuity to that crown was not executed till the reign of Jean II. of France (A.D. 1361).

In the wars of the English, under Henry V. and VI., Normandie came again into their hands, and was almost the last portion of France which they retained. They no longer however held it as a feudal duchy, but as a part of the kingdom of France to which they laid claim. The leading events which occurred in the duchy during that period are noticed elsewhere. [ARC, JEANNE, D'; BEDFORD, JOHN DUKE OF; CHARLES VII. (of France); HENRY V.; HENRY VI. (of England).]

(Sismondi, *Histoire des Français;* Thierry, *Conquête d'Angleterre par les Normands; L'Art de vérifier les Dates*, &c.)

NORRKÖPING, a town in Sweden, situated in 58° 36′ N. lat. and 16° 28′ E. long., on the banks of the river Motala, which falls into an inlet of the Baltic, called the Brävicken, a short distance below the town. This inlet is about 22 miles long, with a breadth varying between half a mile and two miles, and has depth enough for middle-sized vessels, which may sail up to the town. Norrköping is built on both sides of the river. The streets are wide and generally straight, though the town stands on undulating ground; the houses, partly of wood and partly of stone, are only two stories high, but have a neat appearance. Among the public buildings none are distinguished for architectural merit except the town-hall. The manufactures are numerous, though commonly on a small scale. The most important are those of woollen cloth (of which in 1831 not less than 342,922 ells were made), in brass, which occupies more than three hundred persons, in snuff, and paper. Several vessels are annually built. The manufactured goods supply the most important articles for exportation, but they go only to the other towns of Sweden, especially to Stockholm. Iron is also an important article of export, as all the iron worked in Eastern Götaland is exported from this town. Most of the grain grown in the plain of Linköping is also shipped at this harbour. The town had, in 1831, 62 vessels at sea, carrying 3958 tons. The population did not much exceed 10,000 in 1833. It has several good institutions for education, a grammar-school, three free-schools for the lower classes and two for orphans. The Jews are permitted to settle in this town, and have a synagogue. Norrköping is situated in the district (län) of Linköping.

(Forsell's *Statistik von Schweden;* Schubert's *Reise durch das südliche und östliche Schweden.*)

NORRLAND. [SWEDEN.]

NORROY. [HERALDRY.]

NORRSKA FIELLEN (the Norwegian Range), a term lately introduced into geography to indicate the mountain-mass which occupies with its branches the greater portion of the Scandinavian peninsula. This name is more properly applied to the southern portion of the range, which is sometimes also called the Dovre Field, though this name properly belongs to the most northern portion of the Norrska Fiellen. The northern portion of the range is called Kiölen. The boundary-line between the Norrska Fiellen and the Kiölen lies between 63° 30′ and 64° N. lat., east of the Värdals Fiord, the eastern portion of the bay of Trondhiem, where the range is less than 12 miles across, and presents one of the most convenient roads for passing it.

The range of the Scandinavian mountains begins on the south with Lindesnaes (or Lime-cape), the most southern extremity of Norway (south of 58° N. lat.), and extends to Cape Nordkyn (71° N. lat.) and the Varanger Fiord, over a space exceeding 1000 miles in length. The Norrska Fiellen is only about 360 miles in length, but it considerably exceeds the Kiölen range in width and in elevation.

The Norrska Fiellen occupies more than three-fourths of the southern part of Norway. Its elevated rocky masses approach close to the southern and western shores: on the east its boundary is determined by a line beginning on the south on the shores of the Skagerrack at the Langesunds Fiord (9° 40′ E. long.), and thence drawn to the town of Trondhiem, though some of its lower offsets advance considerably to the east of that line. In the whole country west of this line there is no low level, except in the narrow valleys; but on the summits of the rocky masses there are extensive plains.

In the most southern districts, south of 59° N. lat., or of a line drawn from Lyse Fiord to Langesunds Fiord, the mountain-masses do not attain a great elevation. They rise from the sea with a steep ascent to the height of 300 or 400 feet; but at the distance of about 20 miles from the coast they hardly exceed 1000 feet in elevation. Farther north they rise still higher in the Heck Field and in the Bygle Field, which attains an elevation of 2000 feet above the sea. In the latter the upper part of the mountains begins to extend in plains. South of it they are broken into narrow ridges running north and south, and separated from one another by deep narrow valleys. These valleys, though they contain only a small portion of low and level land fit for agricultural purposes, are fertile, and being sheltered against the western and northern winds, have a more temperate climate than any other part of the globe under the same parallel. The declivities of the ranges, nearly to their summits, are covered with forests where they are not very steep, which contain large pines, birches, and beeches. The coast is much broken, but none of the numerous inlets advance more than 5 miles within the mountain-masses, and most of them not half that distance.

Bygle Field and the mountains south of it are only the southern slope of the whole mass. North of 59° N. lat. it attains, in the Yökle Field, an elevation of about 4500 feet, which may be considered as the general height of the Norrska Fiellen as far as the Dovre Field, whose branches extend to 63° N. lat. The highest part of the rocky masses is towards the western shores. These shores are cut up in a very remarkable manner by numerous inlets, which are generally only a few miles wide, but penetrate to a great distance inland, some of them 70 and 80 miles, between the huge mountain-masses that enclose them. Along the open sea and close to the water's edge the mountains are on an average between 600 and 1000 feet high, and they continue to rise as they proceed eastward; so that at the distance of 10 or 15 miles they attain the general level of about 4500 feet, which they preserve for more than a hundred miles. They form indeed an elevated plain of uneven surface, on which are scattered bold peaks, rugged precipices, and extensive lakes. The general elevation of the plain does not rise above the line of perpetual congelation, which in 60° N. lat., in this country, is said to occur at an absolute height of 5600 feet, and in 62° N. lat. at 5100 feet; but it rises considerably above the line of trees, which cease to grow, even in a stunted state, below the height of 4000 feet. The surface of the plain consists either of barren naked rocks, or is covered with extensive morasses. In some places there are tracts on which heath and lichens are thinly scattered. These tracts are inhabited by the rein-deer and lemming. Here and there a few depressions occur in the plain, which in summer are covered with a scanty growth of grass, and

are pastured for about two months; but they are from 50 to 60 miles distant from the nearest village. Along the western shores, owing to their steepness and the western gales to which the declivities are exposed, the mountains are quite bare. But along the shores of the inlets, or *fiords*, there are level tracts of moderate extent, which are partly covered with tall pines, and are partly cultivated. The clear blue water of these inlets, the high mountains rising from their shores with a steep ascent, varied by the forests and cultivated spots, give to the whole a degree of beauty and sublimity which is hardly surpassed in any country on the globe. The scanty and scattered population find their subsistence mainly in the deep sea, which contains fish in abundance. The beauty of these inlets is sometimes much increased by the falls of water from the high rocks which surround them. Some of these falls pour down perpendicularly from a great height, as the Feigum Foss (or Fall), 700 feet, the Sevle Foss, 1000 feet, and the Keel Foss, 2000 feet. These three cataracts occur on the shores of the Sögne Fiord. On the Hardanger Fiord are the Skyttic Foss, 900 feet high, and the Böring Foss, likewise 900 feet high. The eastern declivity of the Norrska Fiellen may be considered to commence about 100 miles from the western coast, near 8° E. long. This slope is much less rapid than the western, occupying about 50 miles in width, and descending in this space about 4500 feet. Its surface is exceedingly broken, consisting of precipitous ridges, which have flat and sometimes extensive plains at their tops, and of deep narrow valleys. Though a few of the ridges, as the Halling Skarven (5436 feet), the Gousta Field (5522 feet), rise above the line of trees, the valleys and a large portion of the declivities of the lower mountains are covered with extensive woods, and the largest and best portion of the timber exported from Norway comes from this region. But the valleys are generally too high for cultivation, though they supply good pasturage. Many of the valleys are occupied by deep and extensive lakes, especially near the beginning of the descent. Several of these lakes are from 2000 to 3000 feet above the sea-level.

The highest part of the Norrska Fiellen is situated at the innermost recess of the Sögne Fiord, and is known by the name of Hurungerne. Its surface is covered with snow nearly all the year round. The Skagstöls Tind, which is 7647 feet above the sea, is the highest summit of this mountain-mass which has been measured. Contiguous to the Hurungerne, on the north-west, is the Sögne Field, which is somewhat lower; but west of the Sögne Field lie the Justedals, or Sneo Bräen, an immense sheet of perpetual snow and ice, covering a surface of more than 600 square miles. This is by far the largest mass of ice in Europe, as the large snow-fields which surround the Finster Aarhorn and the Jungfrau do not occupy more than 200 square miles. The elevation of the Snee Bräen is not known, but it is estimated that the lower parts do not descend below 6000 feet, and that the more elevated portions attain 7000 feet above the sea. From the sides of this mass descend glaciers, which terminate in several lakes at their base. The Folgo Fonden is another remarkable and elevated mountain-mass; it is situated on the southern shores of the Hardanger Fiord, and partly occupies the peninsula formed by this long frith and one of its branches, the Sör Fiord. The masses of ice covering its summit extend 25 miles from north to south, and about 10 miles in average width, so that they occupy a surface of 250 square miles. Its elevation is stated at 5427 feet, but as glaciers descend from the sides to a height of only 2000 feet above the sea-level, the summit must rise above the snow-line, as no glaciers can descend from a mountain which is not always covered with snow. Its elevation consequently must be greater, or the snow-line in 60° N. lat. must occur at a lower elevation than 5600 feet. We suspect the latter to be the case. From this glacier ice is brought to London when there has been no frost in England during the winter.

The most northern portion of the Norrska Fiellen is the Dovre Field, in the southern and highest part of which is the Snee-hätten (snow-hat), which rises to 7489 feet above the sea, and more than 3000 feet above the mountain plain on which it stands. The northern and lower parts of the Dovre Field approach the entrance of the Trondhiem Fiord or Bay of Trondhiem.

The mountain plains of the Norrska Fiellen terminate with the Dovre Field. East of 10° E. long. the rocky masses do not extend in plains, nor do they constitute a continuous range; still the country between 61° 30′ and 63° N. lat. and between 10° and 11° 30′ E. long. is a mountain region, its surface being in general more than 2000 feet above the sea-level, and there being only a few valleys which sink below that elevation. Its surface is exceedingly broken, and presents a continuous succession of ascents and descents. Neither the mountains nor the intervening valleys occupy a large space; mountains generally extend from north to south, in the direction of the whole system, but they rarely continue for a few miles without being broken by deep depressions. Still more rarely do their summits present a level surface. Many of the valleys are only ravines, which however widen towards the border of the mountain-region so as to become narrow valleys, and to admit cultivation, which even extends on the declivities of the mountains to some elevation. The whole region is wooded, though the timber-trees are not so large as on the eastern declivity of the mountain-plains. Several of the mountains rise above the line of trees, but only a few attain the snow-line. The Tron Fiellet (near 62° N. lat.) is 5593 feet, and the Sylfiellen (near 63° N. lat.) is 5747 feet high.

The scanty population of the countries adjacent to the Norrska Fiellen, and the great facilities for communication by sea, account for the small number of roads which traverse this extensive mountain region. Only two roads are fit for carriages; one of these roads connects the two principal towns of Norway, Christiania and Bergen. It runs from Christiania northward, skirting the eastern shores of an extensive lake, the Rands Fiord, at the northern extremity of which it turns west, and begins to ascend the eastern declivity of the mountain mass. It passes over the tableland in a depression lying near 61° N. lat., between the Hurungerne on the north and Mount Sule Tind on the south. The highest point of the road does not much exceed 3000 feet above the sea, from which elevation it descends in a narrow valley between high mountains to the Sögne Fiord, and then traverses a hilly and broken tract till it reaches the Södra Oester Fiord and Bergen. The second road leads from Christiania to Trondhiem. It runs from Christiania north-north-east to the southern extremity of the lake of Miösen; then along the eastern shore of that lake and the banks of the river Lougen, which falls into the lake. After ascending the valley of this river nearly to its northern extremity in a north-north-western direction, it ascends the Dovre Field in a north-eastern direction, passing near the base of the Snee-hätten, where it attains an elevation of more than 4500 feet. As snow-storms are very frequent even in summer in this elevated region, and travellers are exposed to great danger during these storms in an uninhabited region, four *field-stuer*, or houses of refuge, have been erected ever since the thirteenth century; they occur in a space of about ten miles. The road then descends in a northern direction to the valley of the Driv Elf, passes through a depression in the mountains into the valley of the Orkel Elf, and through another depression into that of the Guul Elf, which it follows to the vicinity of Trondhiem. A carriage-road leads from Trondhiem to Röraas, by which the produce of the copper-mines of the last-mentioned place is brought to the port to be shipped. This road follows the road to Christiania as far as it lies in the valley of the Guul Elf, and then runs along this river to its source, where it crosses a mountain-side, probably more than 3000 feet about the sea, west of the lake of Oresund, whence it descends to Röraas, which is somewhat more than 2500 feet above the sea.

The most frequented road, as it appears, is that which lies in the deep depression of the mountains between 63° 45′ and 64° N. lat., which divides the Norrska Fiellen from the Kiölen, and by which the western districts of Swedish Norrland bring their produce to the harbour of Trondhiem, in preference to taking it to the harbours on the Gulf of Bothnia. It runs from the town of Oresund in Oresunds Län on the northern side of the lake of Störsjon, and after passing along the southern base of Mount Areskutan, which is 4775 feet above the sea-level, it traverses the boundary-line between Sweden and Norway, and its highest level occurs west of Stalstugan, where it is little more 2000 feet high. Hence it descends in the valley of the Saul Elf to the eastern extremity of the Trondhiem Fiord, along the shores of which it continues to the town of that name.

North of the depression in which this road lies begin the Kiölen mountains, or the northern part of the Scandinavian range: they present a different character, forming a con-

tinuous range, which in general occupies a space of twenty-five miles in width. Between 64° and 68° N. lat. the range extends in a north-north-east direction, but farther north it runs north-east, and towards its northern extremity, north of 69° 30′ N. lat., east-north-east. Between 64° and 65° N. lat. nearly the whole width of the mountain mass lies within the territories of Norway, but farther north, up to 69° N. lat., it is nearly equally divided between Norway and Sweden, the watershed constituting the boundary-line between these countries. Farther north the Kiölen mountains belong to Norway, except a small tract along the upper course of the Muonio river, which is under the dominion of Russia.

South of 66° N. lat. the highest part of the range is in the middle. It does not generally rise to a great elevation, though always above the line of trees; a few isolated summits are always or nearly always covered with snow. The declivity towards the east is not very steep, descending, in a distance of about ten or twelve miles, about 2000 feet to the base of the mountains, which is about 2000 feet above the sea-level. The lower offsets of the range extend however farther eastward to a distance of about 20 miles; they are commonly below the line of trees, and the valleys embosomed by them are often from six to eight miles wide, and generally covered with woods. The western declivity is exceedingly steep and broken. It descends, in a space of ten or twelve miles, from an elevation of about 4000 feet to the level of the sea. Rugged and precipitous masses of rock enclose long and wide valleys; the rocks are usually bare, or covered with heath and lichens, and sometimes with brushwood, but the valleys contain forests of fine timber-trees, especially that of the Namsen-elf. The elevated rocky masses extend to the very shores of the sea, which consist of a succession of deep inlets and projecting headlands. The Folden Fiord penetrates seventy miles into the rocky masses.

North of 66° N. lat. the high mountain-masses rise to a greater elevation, and occupy a much larger space. Numerous summits lie along the watershed, which are always covered with snow. The highest of these snow-capped summits is the Sulitelma, near 67° N. lat., which is 6155 feet above the sea. Here also the eastern declivity is not steep, but exactly resembles the descent farther south; towards the west however the high mountain-masses preserve a great elevation to the very shores of the sea. Cape Kunnen, near 67° N. lat., consists of rocks which rise in perpendicular precipices to the height of 1000 feet, and at a distance of about four miles inland they attain an elevation of 4000 feet. The whole rock is covered with perpetual snow, the glaciers extending on the south side to the very edge of the sea. This shows that the snow-mass by which this glacier is fed must be very extensive. No glacier occurs on the Norrska Fiellen and Kiölen mountains between the Justedals Bräen and Cape Kunnen. Other parts of the coast are less elevated, but in several places the mountains near the coast rise to 3000 feet.

The islands, which are numerous along the coast, must be considered as portions of the range, and the mountains of which they consist rise to a great elevation. The island of Alsten, which is of moderate extent, rises almost perpendicularly out of the sea, and the seven pointed peaks with which it terminates ascend far beyond the region of snow, rising to more than 4500 feet, whilst the snow-line hardly exceeds 4000 feet. The mountains on the island of Dunnöe are above 3000 feet high. The valleys, which are enclosed between the high masses of the continent, are deep and rather narrow; though in general well wooded, they do not contain timber-trees, and the soil is not adapted to agriculture, except in a few places.

The Sulitelma is the highest mountain in Europe north of the Polar circle. It has been examined by Wahlenberg, a Swede, who found that the snow-line on the Swedish side occurs at about 3800 feet, but on the western declivity it descends nearly 1000 feet lower. The vegetation on the two sides therefore differs considerably. In Sweden the fir-trees ascend the declivity of the Sulitelma to about 1200 feet, the pines to 1400 feet, and the birch to 2100 feet. A mountain on which the birch does not grow is called *fiell*. Above 2100 feet only bushes are found, especially birches, and two kinds of willow, *Salix glauca* and *Salix hastata*, but they disappear at about 2800 feet. The mosses on which the rein-deer feed extend to 800 feet below the snow-line, and to this height the Laplanders advance with their herds in summer. *Ranunculus nivalis* and similar plants are found in the crevices of the bare rock, projecting out of the snow-masses 500 feet above the snow-line, and *Lichenes umbilicati* even 1500 feet higher in similar situations. Higher up all vegetation disappears, and no animal or bird is met with, except the *Emberiza nivalis*.

North of 68° N. lat. the mountains along the watershed of the rivers, which flow respectively into the gulf of Bothnia and into the Atlantic, sink to a much lower level, none of their summits attaining the snow-line. The highest portion of the range lies along the West Fiorden, or the long strait which divides the Lofoden Islands from the continent, and on these islands themselves. In these parts numerous mountain-masses rise above the snow-line. The Faxfield, an isolated mass (near 69° N. lat.), rises to 4260 feet; the mountains along the eastern shores of Lyngen Fiord rise almost perpendicularly above the region of snow to upwards of 4000 feet, and the glaciers descend to about one-fourth of this height. At 70° N. lat. is the Yökle Field, between Quänanger Fiord and Alten Fiord, which rises to 3700 feet, and is covered with extensive snow-masses. It is the most northern snow-mountain of the Kiölen on the continent. In these parts all the mountain-masses are isolated, being separated from one another by deep valleys with steep sides, exactly resembling the deep sounds between the islands lying along the shores. The mountains on the Lofoden Islands are hardly inferior in height. Snow-capped summits occur in East and West Vaage, and they rise in Hindoe and some smaller islands to 3200 feet above the sea. Farther north they are less elevated, but the last snow-mountains occur on the island of Seiland, where they may be considered as a continuation of the Yökle Field, which stands opposite the island, on the continent. The islands farther north up to Mageröe, which contains North Cape, are far less elevated. This is the most dreary part of the Kiölen range. The rocks are naked and the valleys narrow. They contain little wood, and that of a small size. In a few places at the innermost recesses of the friths some few spots occur, where potatoes are cultivated. The sea supplies the scanty population with subsistence.

The Yökle Field may, in some measure, be considered as the termination of the high range. Rocky masses of considerable elevation separate indeed the great bays, called Alten Fiord, Porsanger Fiord, Laxe Fiord, Tana Fiord, and Waranger Fiord, but they decrease in elevation as they proceed farther east. The highest portion of these rocky masses occurs at the extremity of the headlands, on the shores of the Icy Sea, but as they advance south they gradually decrease in height, until at the southern extremity of the fiords they unite in a table-land with an undulating surface, intersected by low long-backed hills of gentle ascent. This table-land descends gradually and continually towards the northern extremity of the Gulf of Bothnia; and it contains the last elevated summits of the Kiölen Mountains. The Vorio Duder, south of the innermost recess of the Porsanger Fiord, probably attains nearly 3620 feet, and Mount Rastekaise, south of the Laxe Fiord, 3200 feet. Between the Tana Elf and the lake of Enara is Mount Peldoive, an isolated height, rising to 2130 feet, but not above the region of the birch. Farther east every trace of mountains disappears. This region is somewhat more favoured by nature than that south of Yökle Field. It is true that the Porsanger Fiord and the bays east of it, being open to the northern and eastern gales, do not admit any kind of cultivation: but on the Alten Fiord, which is sheltered against these winds by the elevated islands lying before its entrance, barley and potatoes are successfully cultivated, and the birch trees attain a considerable size, though this place is in 71° N. lat. It is the most northern place on the globe in which grain is grown.

The Scandinavian range consists mostly of primitive and transition rocks: secondary rocks occur very rarely. Gneiss constitutes by far the most prevalent component of this range. Granite is not frequent; it appears, like the other primitive rocks, in some degree subordinate to gneiss. The transition formation is mostly composed of grauwacke, alum-slate, clay-slate, and limestone, but it also contains sandstone and other rocks. This range is rich in metals. Iron occurs in immense layers on the eastern declivity near its extremities, in Norway, in the province of Christiansand, on the south, and, in Sweden, in Lulea Lappmark, on the north; in the latter, near the church of Gellivara, there are mountains many hundred feet high, consisting entirely of iron-ore. But the rich iron-mines of Sweden are not within the

range; they are situated in the lower country which extends south-east of it. Silver occurs at Kongsberg and Iarlsberg in Norway, and at the Nasafiell in Pitea Lappmark; but it is worked only in the first-mentioned place. Copper is found in the Dovre Field, at Röraas, Medal, and Selby; the mines of Röraas are productive. Lead is also found in the southern district of Norway, and at the Nasafiell. Cobalt occurs in several places on the eastern declivity of the Norrska Fiellen; zinc, marble, and slate also abound in several places.

(Von Buch's *Travels through Norway and Lapland;* Elliot's *Letters from the North of Europe;* Everest's *Journey through Norway, Lapland, and part of Sweden;* Wahlenberg's *Reise auf den Sulitelma;* Schubert's *Reise durch das südliche und östliche Schweden;* Barrow's *Visit to Iceland.*

NORRTELGE. [SWEDEN.]

NORTE, RIO DEL. [MEXICAN STATES.]

NORTH AMERICA. [AMERICA, NORTH.]

NORTH AMERICAN INDIANS. When the Europeans began to visit the coast of North America, they found that continent inhabited by a great number of nations which had made little progress in civilization, as the term is understood in Europe, and were therefore called savages. To judge from the structure of their body, they all seemed to belong to the same race. But it was afterwards discovered that in the most northern regions there were tribes which differed considerably from the rest in their physical character. These northern tribes, which belong to one nation and speak one language, are called Esquimaux, and the description which M'Keevor gives of their personal appearance is inserted in the article ESQUIMAUX. The same author indicates the differences which exist between them and the other tribes in his description of the Crees. [CREES.] If we compare this latter description, and the drawings of the heads, prefixed to Chappell's 'Voyage to Newfoundland,' with the drawings, in Kotzebue's 'Voyage of Discovery,' of the inhabitants of Kotzebue Sound, it can hardly be supposed that the inhabitants of the countries round Hudson's Bay and those of the north-western extremity of North America belong to the same race. The inhabitants of Kotzebue Sound exhibit the features of the Mongol race, the broadest part of their face being somewhat below the eyes, from which point the face narrows towards the chin and towards the upper part of the head, thus producing some resemblance to a lozenge, according to an expression of Dr. Fr. Buchanan, in his description of the inhabitants of India without the Ganges. The broadest part of the face in the North Americans who live east of the Chippewyan range is in the upper part, as far down as the cheek-bones, whence the face narrows to the chin. Humboldt observes that the forehead of the Americans is considerably inclined backwards, and with it the whole facial line, while in the Mongols it approaches much more to the form of the skull of the Caucasian race. It would seem therefore that America has not been entirely peopled by any of the nations which inhabit the eastern countries of Asia, for all of them, from the Gulf of Siam to Behring's Strait, exhibit the characteristic features of the Mongol race. It is only the tribes scattered along the north-western shores that resemble those which inhabit the north-eastern coast of Asia. Kotzebue did not observe any difference between the inhabitants of Kotzebue Sound and the Tschukutskoi, except that the latter were something taller and stouter.

Besides the language of the Esquimaux, which is peculiar to that nation, the North American tribes inhabiting the country east of the Chippewyan Mountains seem to speak three principal languages, with a multiplicity of dialects peculiar to individual tribes. The most southern language is spoken by the tribes to which, since their emigration in 1837 and 1838, the countries have been assigned which lie on both sides of Red River, the Mississippi, and the Arkansas river, namely the Creeks, Chickasaws, Chocktaws, Seminoles, Cherokees, and some smaller tribes. The Iroquois is spoken by the Mengwe, or six nations, in New York, the Wyandots in Ohio, Michigan, and Upper Canada, and some other tribes near Lake Michigan and Lake Superior. The Lenni-lenapé, Algonquin, or Cree language, is used by all the tribes inhabiting the country west of Hudson's Bay, and also by those who occupy the tract between Lake Superior and the Chippewyan mountains. The nomadic tribes of the desert extending along these mountains southward to the Red River of the Mississippi seem to speak the same language, which appears also to be spoken in the countries west of the Chippewyan range and south of the Columbia river. But with respect to the languages spoken in the other parts of the north-western coast of America, our information is too scanty to enable us to form any opinion as to their connection or affinity.

When the Europeans began to settle on the eastern shores of North America, the adjacent countries were inhabited by aboriginal tribes, some of which are stated to have been very numerous. In the space of about 200 years many of these tribes have entirely disappeared, and others have left the eastern country and retreated into the interior. The destruction of these tribes is owing to the settling of the Europeans in America. It is generally supposed that it has been brought about partly by the extension of cultivation, by which the hunting-grounds of the aborigines were gradually limited, so that they could not find subsistence by the chase, and partly by the war which the settlers carried on against them. But we are inclined to think that the most efficient cause in bringing about their destruction was the use of fire-arms, by which the wars, which always exist between single tribes, were rendered much more destructive of life. The small-pox was probably not quite so destructive as the musket; yet even a few years ago several numerous tribes were much reduced by that disease, and the Mandans were nearly annihilated by it. Owing to these and other causes, the number of aborigines in the countries contiguous to the Atlantic had been so much reduced, that at the commencement of this century only a few tribes were found in the United States east of the Mississippi river, and still fewer in the British colonies of New Brunswick and Lower Canada, where they were only in possession of the rocky and elevated region which extends on both sides of the St. Lawrence river below the town of Quebec. In Labrador however and the other countries surrounding Hudson's Bay the native tribes still exist.

The number of Indians in the countries east of the Mississippi was, in recent times, comparatively small. They inhabited distinct districts, but were surrounded by a white population. The whites did not always behave towards them according to the rules of justice, and this created ill-will in the minds of the Indians. Accordingly the Indians usually joined the enemies of the republic, as appeared in 1811, when they joined the Spaniards, and in 1812, when they joined the British. The general government of the United States was well aware of the danger of having such subjects within their territories, who, in addition to what has been stated, in no way coalesced with the other inhabitants, nor was it probable they ever would. The government accordingly wished to remove them to those parts of their territories where no invasion of an enemy could be feared, to place them, if possible, where they would have no connection with the great bulk of the white population. Still no effective steps for this purpose were taken till 1834, when the state of Georgia expelled the Cherokees from its territories, and at the same time the Seminoles in Florida began to make war on their white neighbours. The executive of the general government was now empowered to remove the Indians to the west of the Mississippi river, under treaties, and to assign them territories with fixed boundaries, and at the same time to declare that it should not be lawful for whites to settle among them, except some few mechanics who would be required for agricultural purposes, especially blacksmiths, wheelwrights, and millers. The country assigned to them is situated to the west of the states of Arkansas and Missouri, and of the new territory of Iowa. The greatest part of this country consists of extensive prairies without trees or water, and is quite unfit for white settlers. But extensive bottoms occur along the rivers, which are considered quite sufficient to maintain the scanty population of Indians, when cultivated with care. It is very improbable that the United States will ever be attacked by an enemy from this side, and they have now nothing to fear from the Indians uniting with their enemies. The plan has been well executed, as the general government has acted with more than common liberality. A good price was stipulated for the cession of the tracts inhabited by the Indians, and the money was divided into three unequal parts, according to the circumstances of each tribe. One part of the money was appropriated to the liquidation of the debts which the tribes and the individuals composing them had contracted with their white neighbours; another part was appropriated to paying the expenses of their removal and those incurred in the

establishment of the new settlements; and the third was to provide an annuity until they should have ample means of procuring subsistence. Under such treaties, the Indians, who, up to the year 1836, had resided east of the Mississippi, are to be removed to the west of that river. All the tribes, except the Wyandots in Ohio, have accepted the conditions, and the greater part of them took possession of their newly-assigned territories during the years 1837 and 1838. The remainder, it is supposed, will follow in 1839 and 1840. The following table is taken from the last Report of the Commissioners of Indian Affairs, dated November 25, 1838:—

Names of the Tribes.	No. of individuals to be removed originally.	No. of individuals removed before Nov. 25, 1837.	No of individuals removed since Nov. 25, 1837.	No. of individuals still to be removed.
Chippewas, Ottawas, and Pottawatomies	8,000	2,190	151	5,648
Pottawatomies of Indiana	1,786	494	768	150
Choctaws	18,500	15,000	177	3,323
Quapaws	476	476	..	..
Creeks	22,000	20,437	4,106	750
Florida Indians	3,765	1,079	1,851	835
Cherokees	22,000	7,911	18,000	..
Kickapoos	588	588	..	..
Delawares	826	826	..	..
Shawnees	1,272	1,272	..	..
Ottowas	420	374	..	200
Weas	225	225	..	..
Piankeshaws	162	162	..	..
Peorias and Kaskaskias	132	132	..	..
Senecas from Sandusky	251	251	..	..
Senecas and Shawnees	211	211	..	..
Ottowas and Chippewas	6,500	..	..	6,500
Winnebagoes	4,500	..	..	4,500
New York Indians	4,176	..	..	4,176
Chickasaws	5,000	..	4,600	400
	100,790	51,629	29,653	26,482

It appears from this table that the whole number of Indians who were to be removed to the countries west of the Mississippi does not much exceed 100,000, and that the removal of about four-fifths had been effected at the end of 1838. We shall now notice the countries which the principal tribes have hitherto occupied, and the territories which are assigned to them on the west of the Mississippi, and add a few observations on their present condition and progress in civilization.

The more numerous tribes which inhabited the southern states of the Union have been settled on the Red and Arkansas rivers. The Chocktaws and Chickasaws, who occupied the largest portion of the state of Mississippi [MISSISSIPPI], are now established on the Red River and the country between this river and the Arkansas; the Chocktaws, in the districts contiguous to the boundary line of Arkansas; and the Chickasaws, in those which lie along the frontier of Texas. The Chickasaws also occupy the south fork of the Canadian river, but a great number of the Chickasaws have settled among the Chocktaws. As both tribes speak the same language and intermarry with each other, there can be no doubt that in a few years they will be one people. The Chocktaws are governed by a written constitution and laws. They meet annually in their general council on the first Monday of October. The nation is divided into three districts; each district sends ten councillors, elected by the votes of the males who are twenty-one years old and upwards. They have only a representative body; the three hereditary chiefs have a veto on all measures passed by the council, which however when passed by two-thirds become a law. They have judges and officers to enforce the laws, with a jury chosen in the ordinary way. Since their settlement in their new country, the Chocktaws have changed their constitution so far as to admit the Chickasaws into their council, with a chief and ten councillors, which it is supposed will greatly contribute to unite both tribes into one. Both tribes apply to agriculture with industry and skill, and raise corn, beans, pumpkins, and melons in abundance; in the southern districts they also cultivate cotton. They have extensive pasture-grounds for cattle and hogs on the prairies which extend between the two rivers. They have also several schools, and a number of missionaries are settled among them.

The Creeks, who previously to 1837 were in possession of an extensive tract in the state of Alabama [ALABAMA; CREEK INDIANS], are now settled on the northern fork of the Canadian river, where they possess extensive and fertile bottoms for the cultivation of corn, pumpkins, beans, melons, &c., but their pasture-grounds are inferior to those of the Chocktaws. A portion of them have settled on the Arkansas river. They are more inclined to labour than any other tribes, and they are good agriculturists. They are at present opposed to missionaries being sent to instruct them. They have not, like the Chocktaws, formed a constitution and laws, except such as are passed by the chiefs in council. The Seminoles, or Florida Indians, are settled on the northern fork of the Canadian river, between the two tracts occupied by the Creeks. They are much behind their neighbours in civilization, and not much disposed to agricultural labour.

The Cherokees, who formerly occupied a portion of Georgia and Alabama, are now established on the bottoms of the Arkansas river, where they cultivate maize, wheat, oats, potatoes, beans, and vegetables. They are further advanced in civilization than any other Indian tribe. They are governed by written laws, enacted by the council of the nation, which meets annually in October. Judges are appointed in each district, with a sheriff to execute the laws. Trial by jury exists, and generally the laws as to property and the punishment of crimes are the same as in the United States.

The two smaller and united tribes of the Senecas and Shawnees, which formerly inhabited some tracts in Illinois, are now settled on the Neosho river, an affluent of the Arkansas from the north; and the Quapaws, who formerly lived within the state of Arkansas, have been removed to the same parts. These three tribes have not made much progress in agriculture and the arts of civilization, and are much exposed to the depredations of the Osages, a tribe which occupies the banks of the Osage river, and gains its livelihood chiefly by hunting. But as game begins to be scarce, the Osages are often in distress, and plunder their neighbours.

As most of the tribes which are dispersed through the states north of the Ohio were averse to removing to the countries on the Red and Arkansas rivers, several of them have been settled west of the state of Missouri, on the banks of the Osage and Kanzas rivers and on the Missouri river itself. The four small tribes of the Weas, Piankeshaws, Peorias, and Kaskaskias, with a small number of the Ottowas, altogether not exceeding 1000 souls, occupy the tracts adjacent to the northern banks of the Osage river, and in their neighbourhood are also settled the Pottawatomies of Indiana, who somewhat exceed 1000 in number. All these tribes, through not yet entirely accustomed to agricultural labour, raise nearly as much maize, potatoes, and other articles as are required for their subsistence, and show a disposition to adopt exclusively agricultural habits. A few of them send their children to school, especially among the Peorias.

The tribes of the Shawnees, Delawares, and Kickapoos, which, taken together, compose a population of above 2500, are settled near the confluence of the Missouri and Kanzas rivers, and on the bottoms contiguous to the last-mentioned stream. These nations have entirely given up the chase, and have begun to cultivate the country assigned to them with great industry; they raise maize, beans, peas, potatoes, turnips, and melons in abundance. Many of them send their children to school.

The Chippewas, Ottowas, and Pottawatomies, who were removed from the state of Michigan, are settled on the banks of the Missouri, north of its confluence with the Kansas river. But as they have not yet decidedly adopted agricultural habits, the labour of the fields is still left to the women, who cultivate potatoes, pumpkins, melons, &c.

In this way the aboriginal tribes, who have removed to the west of the Mississippi, have been distributed. The settlement of such a number of Indians in these parts must of course reduce the extent of the hunting-grounds of those tribes who inhabit these regions, and consequently their means of subsistence. This is however much less the case than may be imagined. The countries on the Red and Arkansas rivers, where the most populous tribes are settled, were nearly uninhabited, none of the wandering tribes having chosen them for their exclusive and permanent hunting-ground, on account of the want of game and the scarcity of buffaloes. They were only visited from time to time by small bands, mostly belonging to the Pawnee nation. The case is somewhat different with the tribes settled on the banks of the Missouri river and its affluents. They partly

occupy the hunting-grounds of the Osages, Pawnees, Otoes and Missourias, and Omahas; and it is probable that this circumstance will lead to some hostilities. It is hoped however that they will not be destructive or lasting, as these tribes do not depend entirely on the produce of the chace for their subsistence, but cultivate their lands, though only to a small extent.

It is the general opinion that all the aboriginal tribes of North America originally obtained their subsistence by hunting and fishing, and that agriculture was introduced among them by the Europeans. But this opinion appears to be in some degree erroneous, for most of these tribes cultivated the ground to a small extent, and raised maize, pumpkins, melons, and tobacco. This amount of agriculture was not limited to the tribes which inhabited the southern states of the Union, but extended to those in the valley of the Missouri to its great bend (near 47° N. lat.), where the Mandans and Minitaries lived in permanent villages, and cultivated maize and some vegetables even when they were first visited by the whites. The labour of the fields however was entirely left to the squaws, or women, and limited to what could be done with the hoe. The produce thus raised was insufficient for the maintenance of the families, and the deficiency was supplied by the produce of the chace. Most of the tribes bordering on the newly settled Indians are in this semi-barbarous condition, as the Osages on the Osage river, the Kanzas on the Kanzas, the Pawnees on the Platte river, the Otoes and Missourias, and the Omahas, who live in the valley of the Missouri north of its confluence with the Platte or Nebraska river, and finally the Mandans and Minitaries. The tribes which occupy the country between the Missouri and Mississippi are not more advanced in civilization; but these tribes have lately begun to use the plough, and even the male population are inclined to take part in agricultural labours.

The aboriginal tribes, which entirely subsist on the produce of the chace, and have no permanent residence, are found within the territories of the United States only along the Chippewyan mountains, and range over the extensive desert which stretches from the base of the mountains about 400 miles eastward. The number of these wandering tribes is very great, but most of them belong to two great nations, known by the names of the Sioux and Blackfeet. The several tribes of the Sioux of the Upper Missouri speak the same language, and range over the whole extent of country from the Mandan villages to the head of the rivers Platte and Arkansas. Some of their tribes occupy the country east of the Missouri, and extend eastward to St. Peter's river. The Blackfeet chiefly inhabit the mountainous country which extends around and among the different rivers by which the Missouri is formed; but they extend their hunting excursions northward to the Saskatchevan, and southward to the Platte and Arkansas rivers. As the Chippewyan mountains within the limits of the Blackfeet territory contain several depressions which present no obstruction even to the passage of wheel-carriages, the Blackfeet frequently pass to the banks of the Columbia river. Though they are all called Blackfeet, it is supposed that some of their bands speak different languages.

These barbarous nations appear to have no laws except such as grow out of usage or such as are sanctioned by common consent. The executive power seems to be vested in the chiefs and warriors, but in cases of importance, and especially when they make war or peace, the grand councils of the nations deliberate on the matter. To these councils, which are called *medicine*, or rather *magic feasts*, none are admitted but the principal men of the nation, or such as have signalised themselves by their exploits in battle, hunting, stealing horses, or in any other way that is accounted laudable by the Indians. The decision to which the council comes, of whatever nature it may be, is published to the people at large by certain members of the council, who perform the office of criers. On such occasions the criers not only proclaim the measures which have been recommended, but explain the reasons of them and zealously urge the people to support them. It is also the business of the criers, who are generally men of known courage and approved character, and are able to enforce their precepts by an appeal to their own example, to harangue the people of the village daily and to exhort them to such a course of life as is deemed praiseworthy. On such occasions, which are at the quiet time of morning or evening, the crier marches through their temporary villages, uttering his exhortation in a loud voice, and endeavouring to inculcate correct principles. The young men and children of the village are directed how to demean themselves, in order to become useful and to enjoy the esteem of good men and the favour of the good spirit. They believe in the existence of a Supreme Being, whom they denominate 'Master of Life,' or 'Good Spirit,' but their ideas of his attributes are vague and confused.

The country inhabited by these tribes is frequently traversed by the citizens of the United States in their expeditions to the Columbia river. The Americans also carry on a considerable trade with the Indians themselves. The quantity of furs which they procure is small, but they obtain a great number of buffalo hides.

Passing to the British dominions in North America, we find in Lower Canada only small remnants of the once powerful tribes of the Iroquois, or Mohawk Indians, the Algonquins, and Hurons, who live in small villages, amidst the white settlers, and have adopted agricultural habits, raise maize, wheat, some other grains, potatoes, and other vegetables. The Mic-Mac Indians, who occupy the shores of the Bay of Chaleurs and the banks of the river Ristogouche, are more numerous. They live by fishing, and do not cultivate any kind of vegetables. The mountainous country north of the St. Lawrence river, on both sides of the Saguenay river, the shores of St. John's Lake, and the interior of Labrador, are occupied by the tribes of a nation which is called Montagnais, or Mountain Indians, who wander about in that extensive region without any fixed residences, and live by hunting and fishing.

The tribes which still occupy a great portion of Upper Canada are more numerous. A large part of the country between the river Ottawa and Lake Huron is still in their possession. The principal nations in this tract are the Ottawas and Chippewas, who live in the countries which surround Georgian Bay on the south, and on the Manitoulin Islands, and are allied with the tribes known by the same name and occupying the north-western part of the state of Michigan, and the Missisaqua Indians, who occupy the eastern shores of the Georgian Bay. All these tribes live by hunting, and possess a country rich in game and fur-bearing animals. The shores of Lake Superior, as well in Upper Canada as in the United States, are inhabited by the Ojibwas, who seem to be only a branch of the nation called the Crees, or Knistineaux, which extends farther north to the shores of Hudson's Bay and the Mississippi or Churchhill river. These nations are hunters. The country on both sides of the boundary-line between the United States and the British possessions, and extending from Lake Superior to the Chippewyan mountains, is in possession of two nations, the Chippewas and Assinaboins. The Chippewas, who occupy the eastern districts as far west as the Red River of Lake Winnipeg, inhabit a rocky country almost entirely destitute of game, and live partly by fishing and partly by collecting the wild rice which covers most of the lakes and swamps with which this country abounds. The Assinaboins, who live west of the North Red River, are considered as a branch of the Sioux, and visit the plains south of the Saskatchevan river in quest of buffaloes, which form their chief subsistence.

Neither the Assinaboins nor the Crees extend their wanderings to the base of the Chippewyan mountains, the former being divided from them by some tribes of the Blackfeet, and the latter by the Asseeneepoytuk, or Stone Indians. The last-mentioned tribe hunts on the extensive plains between the forks of the Saskatchevan river. The Crees extend their excursions northward to the banks of Athabasca Lake. North of this lake and along the shores of Slave and Mackenzie rivers are the Beaver Indians, the Hare Indians, and the Louchen Indians, and in the countries east of the river the Copper and Dogrib Indians. The three last-mentioned tribes are separated from the Icy Sea by the Esquimaux, who occupy the shores of that sea. All these tribes live principally by hunting, but they also fish in the extensive lakes which cover a great portion of their country.

Our information respecting the aboriginal tribes which inhabit the countries west of the Chippewyan range is too scanty to enable us to give even a list of them. The most powerful tribes on the banks of the Columbia river, the only portion of the north-west coast of America which is tolerably well known, are the Snake Indians, or Shoshonees, and the Flatheads. The Shoshonees occupy the countries

on the southern and the Flatheads those on the northern branches of the Columbia river.

(Long's *Expedition to the Rocky Mountains*, by James; Long's *Expedition to the Sources of St. Peter's River*, by Keating; Franklin's *First* and *Second Journey to the Shores of the Polar Sea*; Irving's *Astoria*; M'Keevor's *Voyage to Hudson's Bay*; Kotzebue's *Voyage round the World*; Bouchette's *Topographical Dictionary of Lower Canada*; *Annual Report of the Commissioner of Indian Affairs*, Washington, 1838.)

NORTH CAPE. [TRONDHIEM.]

NORTH KYN CAPE. [TRONDHIEM.]

NORTH SEA. The *German Ocean*, though touching out a small portion of modern Germany, and though more commonly called the North Sea, still maintains its antient name, derived from Oceanus Germanicus. (Ptolemy, *Geogr.*, lib. ii., cap. 3.) It is separated from the Atlantic by the British Islands, which form its western limits, and on the opposite side by Norway and Denmark from the Baltic. To the southward it is bounded by the coasts of France, Belgium, the Netherlands, and Germany; and to the northward an open space between the Shetland Isles and the Norwegian province of Bergen unites it to the Polar Sea. With the Atlantic it is connected through the Strait of Dover by the English Channel; and with the Baltic by the broad gulf called the Skagerrack, which, turning to the southward round the peninsula of Jutland, there takes the name of the Kattegat; and then divides into the three navigable but narrow passages called the Sound, the Great Belt, and the Little Belt. It extends across ten degrees of latitude and eleven of longitude; its greatest length may therefore be taken at 600 geographical miles, its extreme breadth at 350, and its superficies at about 140,000 square miles.

On its north-eastern side the bold rocky face of Norway, intersected by deep fiords, rises precipitously from its bosom; but the sea here receives few tributary streams from the interior mountains, and it preserves a depth of many hundred feet along the base of the cliffs. Its south-eastern and southern coasts are low; the Elbe, the Weser, the Rhine, and the Scheldo pour out through those alluvial shores enormous quantities of sand, which have more or less filled up the southern portion of the basin. This sand, as it subsides through the water, is swept by the alternate flood and ebb into long sinuous and shallow banks, which, rising in narrow ridges towards the surface, place themselves in directions parallel to the contiguous shores, or rather in lines radiating from the Strait of Dover, through which the North Sea tides enter and return. The east coast of England partakes of the same character, and is exposed to the same effects; the Thames, the Ouse, the Humber, the Tyne, the Forth, and the Tay, contributing their unceasing though comparatively trifling efforts to front the shore with similar shoals. All these shoals and banks obstruct the free navigation of the sea, and, combined with the stormy and foggy character of the climate, have led to the destruction of an immense number of vessels. There are other banks, which do not seem to be attached to the shores or to assume the same ridge-like form, but which have been equally the result of the same causes; for however weak may be the impulse of the rivers at such a remote distance from the shore, or however slow the transporting power of the tides, yet, when multiplied by the action of successive ages, they will sufficiently account for the deposit of all these submarine accumulations. Such are the long North Bank, the Dogger Bank, the Well Bank, the Broad Fourteens, and others which need not be enumerated. No accurate representation of any of these banks has ever yet been made: the best charts have merely consisted of the patchwork improvements of consecutive corrections, or of the reports of pilots who were without the means of giving precision to their discoveries; and it is therefore with great satisfaction that we find Great Britain at length taking up this important desideratum, and employing an active and skilful naval officer in a thorough investigation of the whole sea. Beginning to the southward, where he has received every facility from the Dutch and Belgian governments, and advancing regularly by zones, he will be able to produce a complete map of the singularly undulating surface of the bottom, noting every variety of sand, gravel, or shells, along with their characteristic tints. This survey will be as valuable to the mariner, whose existence depends on a correct knowledge of the varying depth beneath his keel, as it will be interesting to the philosopher who contemplates the gradual operations of nature. The deep holes which are found in this sea form another of its singular features. There are several of these holes, but it will be enough for our purpose to particularise the 'Little Silver Pit' off the coast of Holderness in Yorkshire. The northern end of this singular hole is in 53° 45′ N. lat., 0° 47′ E. long., from whence it runs in rather an irregular form and nearly on the true meridian to 53° 20′ N. lat., 0° 43′ E. long., a length of 25 miles. Its breadth at the northern end is little more than half a mile, but towards the middle it is two miles, whence it narrows to one mile and a quarter, and again increases to two miles in breadth towards the southern end. The Little Silver Pit, so called in contradistinction to the Great Silver Pit (which is an extensive space of comparatively deep rocks between the Dogger and Well banks) is situated seven leagues eastward of the entrance of the river Humber. The depth of the water on its edges varies from 50 to 80 feet, and yet, in this singular submarine ravine there is a depth of 330 feet, in 53° 31½′ N. lat., 0° 41½′ E. long., the deepest part of this hole yet discovered. But the most surprising feature of the Little Silver Pit consists in the great steepness of its sides, and it would appear somewhat extraordinary, taking into consideration the sandy, gravelly, and loose nature of the surrounding ground, together with the action of the tides, which run at the springs with a velocity of more than three miles an hour in a diagonal direction across it, that the hole is not in course of gradual filling up. But on the other hand, when we further consider that in most of its parts we find a bottom of mud and clay, we have a strong proof that the surrounding materials are not in any great degree washed down into it, and are therefore compelled to acknowledge that an air of mystery belongs to its character, still remaining to be explained away. The Little Silver Pit is marked in charts of very antient date, another proof that it is kept open from some great and unknown cause. It is the resort of fish of various kinds peculiar to the North Sea as ground-fish, and soles of unusually large dimensions have recently been taken from it, but it is a place very dangerous to trowling-nets by reason of its narrowness, the perpendicularity of its sides, and the diagonal set of the tides, rendering it extremely difficult to drag nets fairly along its bottom. The North-north-east hole, so called from its position with respect to Cromer, is another of these remarkable places, and characterised nearly as the other is; it is situated eight leagues to the eastward of the Little Silver Pit; its greatest depth yet discovered does not however exceed 265 feet.

One island only interrupts the uniformity of this sea, Helgoland Rock, which lies off the mouth of the Elbe, unless the Bell Rock and the May Rock, situated in the opening of the Frith of Forth, may be so called: on each of these three insulated spots lighthouses have been erected. Lighthouses have likewise been established on all the salient points of the coast, as well as at the entrance of all the principal ports; and floating-light vessels have also been moored on several of the detached banks. Between Dover and the Shetlands 56 lights may be reckoned, and on the opposite continent 25 succeed each other from that on Cape Grinez in the Strait of Dover to the entrance of Bergen. Multitudes of buoys and beacons have also been placed on the sand-banks, wherever the swell of the sea would admit of their being secured, in order to mark the proper channels, but no pains or expense can be too great to ensure the safety of the skilful and hardy seamen who traverse this sea, or to facilitate the extensive traffic which it is the means of supporting between the active and industrious nations that inhabit its shores. It carries the great staple commodities of the northern regions of Europe, their coals, the timber of their inexhaustible forests, their hemp, and their hides and tallow, and bears back in return the manufactures, the necessaries, and the luxuries of more favoured climates. It is the marine highway to the capitals of eight different states, and it may be asserted that no sea in the world of equal dimensions can boast of half such a commercial intercourse, either in the number of vessels which it employs or in the general value of their cargoes.

The profusion of fish in the German Ocean has in all ages been celebrated, and the protection of its fisheries has given rise to more than one national quarrel. The skill and enduring perseverance of the hardy Dutch and British fishermen who frequent this turbulent sea are proverbial: at all times of the year they brave its inclemencies

in pursuit of the fish which are in season. The principal of these are cod, hake, and ling, with turbots, soles, and other flat fish, and especially the vast swarms of mackerel and herrings which at certain periods visit our shores, and which give active employment to thousands of men, women, and children. The lobsters found on our own rocky coasts are not sufficient to supply the demand, and the London market alone employs five or six vessels constantly plying between this country and Norway, which seems to be their favourite habitation. When brought over, they are deposited in large wooden cases, properly perforated, and secured in a creek called Hole-Haven, on the Essex side of the Thames, near the upper part of Sea Reach, from whence they are transmitted to Billingsgate according to the consumption.

To trace the course of the tides in the German Ocean would require a long article, so various are the phenomena, and so incongruous do they at first sight appear; the flood running to the northward along one part of our coast and to the southward in another; rising upwards of 20 feet in some of its æstuaries, and elsewhere being scarcely perceptible; and though everywhere regulated by the phases of the moon, yet showing high-water in one place at the same moment that it is low-water in another. A few words will explain the general principle of these apparent irregularities. The great tidal wave which rolls up from the Atlantic Ocean splits at the south-west angle of Ireland into two streams, one of which pursues its straight course up the English Channel, though somewhat retarded in its progress by the converging shores; while the other passes to the northward, and bending round the north of Ireland and Scotland, pours through the Pentland Frith with a velocity of seven or eight miles per hour, or, sweeping round the Orkneys and Shetlands, turns to the southward along the coast of Great Britain, but spreading as it goes across the whole expanse of the German Ocean. This circuitous course requires more time for the transmission of the northern wave than that which arrives through the Strait of Dover, and therefore when the two flood-tides meet, which takes place off the coast of Essex, the northern is half a day later than the other branch from which it was originally separated. On the coast of Holland this meeting occurs not far from the Texel, but in the widening interval between those two shores these opposite streams seem to neutralise each other, so as to produce neither rise nor fall. Besides the action of the lunar tides, the effects of distant currents are sometimes manifest in the northern part of this sea, produced by the melting of the polar ice, and, in an opposite direction, by the continuous movement of an offset from the Gulf Stream of America.

The icebergs which quit the arctic seas and melt in the vicinity of the German Ocean, the overflowing of the Baltic Sea, and the volume of fresh water constantly pouring into its confined space from the surrounding rivers, sufficiently prove, whatever may have been asserted to the contrary, that its water must contain considerably less salt than that of the Atlantic.

NORTH-WEST PASSAGE. If a vessel by sailing from the western shores of Europe in a north-west direction were to enter the Pacific, it would be said to have made the North-West Passage. The first attempts to accomplish such a voyage are nearly coeval with the discovery of America. These attempts have been frequently renewed, but it is still doubtful if such a voyage can be accomplished.

A few years after the discovery of America, Vasco de Gama succeeded in reaching the shores of Malabar in Hindustan. He returned to Europe in 1499. On comparing the geographical position of the countries discovered by Columbus and Vasco de Gama, it was evident that an immense space lay between them. This space comprised the great kingdom of Cathay (China), which on the globes and maps made by the German geographers of that time, on the authority of Marco Polo (who however had not determined the geographical position of any place which he visited), extends more than twenty degrees east of its true position. It was therefore concluded in Portugal, that Vasco de Gama had only sailed half way to Cathay, and that the countries discovered by Columbus were much nearer to Cathay than the coast of Malabar was. It was supposed, that if a vessel were to sail past the countries discovered by Columbus, either to the north or the south, it would reach Cathay. This consideration gave rise to the first attempt to make a North-West Passage, which was viewed as of such importance, that the attempt was made before the second Portuguese fleet, under the command of Cabral, was despatched to the East Indies. In 1500, Gaspar de Cortereal, a distinguished nobleman, was sent out to make the North-West Passage. He discovered a large part of the north-eastern coast of Labrador, and, as it is said, to the extent of 600 or 700 miles. The following year he returned to the place to which his discoveries had extended, and came to a strait, which was called the Strait of Anian, after the name of one of the officers. It can hardly be doubted that this is the strait which is now called Hudson's Strait. Being entangled in the floating ice which encumbers that strait all the year round, his vessels were separated. The vessel of Gaspar de Cortereal was never heard of, but the two others returned to Lisbon. A brother of Cortereal sailed in 1502 in search of him, but he also never returned. After these disasters the Portuguese abandoned the attempt.

John Cabot had previously (1497) discovered the island of Newfoundland, but evidently without any design of discovering a North-West Passage. His son Sebastian Cabot, who had accompanied him on his voyages, sought for the passage in 1517, when he accompanied Sir Thomas Pert, but this voyage added nothing to what had been done before. For a long time no attempt was made, probably because Magalhaens had succeeded in entering the Pacific at the southern extremity of America by the strait which bears his name.

The spirit of maritime discovery was excited in England about the middle of the sixteenth century, and lasted more than fifty years. All the numerous attempts made in this eventful period were at the expense of private persons, or rather at the expense of companies of merchants. The attempts were first directed to the discovery of a North-East Passage, by which it was proposed to reach the Pacific by sailing from west to east along the northern shores of Asia. The real extent of the continent of Asia was then unknown. Three vessels sailed under the command of Sir Hugh Willoughby and Richard Chancellor in 1553, for the sea which washes the northern coast of Europe. The vessels separated: Sir Hugh perished with his whole crew on the coast of Lapland, and Chancellor entered the White Sea. Chancellor's discovery was of importance: it led to the establishment of a trade between England and Archangel, and to the design of the English of carrying on commerce with India by means of the Volga and the Caspian Sea. This enterprise of trading with India through the Volga so completely engrossed the attention of the merchants of London, that all further attempts at discovering the North-East Passage were abandoned. Towards the end of the sixteenth century the Dutch commenced their enterprises in this direction, for which they had a strong motive. Having risen in arms against Philip II., king of Spain, who was then also king of Portugal, their vessels were excluded from the ports of America and of the East Indies then in possession of those nations. In their voyage to such parts of the East Indies as did not belong to the Portuguese, and on their return home, they had to traverse a large extent of sea, of which the Spaniards then claimed the dominion, and in which their merchant vessels were in danger of being taken. The Dutch merchants accordingly resolved to try if it was possible to reach the East Indies by a North-East Passage. William Barentz made two voyages (1594-1596), but was unable to proceed east of Nova Zembla and the Strait of Waygatz, on account of the quantity of ice which always covers the sea to the east of that island. Since his last voyage, in which he passed the winter on Nova Zembla, the North-East Passage has been given up as impracticable.

In the meantime the North-West Passage was lost sight of until the year 1576, when the attempt was again made by the English, who prosecuted this object with great ardour for forty years. All that has been effected towards discovering the North-West Passage is due to the English. The first English seaman who did anything decisive towards this object was Martin Frobisher, who made three voyages (1576, 1577, and 1578) to the northern seas. In the second voyage he discovered Frobisher's Strait (63° N. lat.), and in the third he re-discovered the Strait of Anian, or Hudson's Strait. He was followed by John Davis, who likewise made three voyages (1585, 1586, and 1587). In the first voyage he discovered Davis's Strait between Greenland and Cumberland Islands, sailed up to Mount Raleigh (66° N. lat.), and afterwards found the inlet, now called

Cumberland Strait (65° N. lat.). In his third voyage he extended his discoveries along the western shores of Greenland as far north as Sanderson's Hope (72° N. lat.), and in sailing southward he likewise found the entrance of Hudson's Strait, which had been seen before that time by Corteral and Frobisher, but none of these three navigators seem to have advanced any great distance into it. [DAVIS.] Henry Hudson, after several unsuccessful voyages of discovery to the north-east and north, directed his last voyage to the north-west, and penetrated through the strait into the bay, both of which are now called by his name. He passed the winter on the shores of the bay, hoping to find a passage to the Pacific in the following year, but his crew, which had suffered great hardships during this voyage, mutinied, and abandoned him and some of his adherents in a boat in the middle of the bay. Hudson was never heard of afterwards. [HUDSON.] In the two following years some parts of Hudson's Bay were explored. In 1612 Sir Thomas Button discovered Roe's Welcome, the strait between Southampton Island and the continent; and Bylot in 1613 discovered Fox Channel between Cumberland Island and Southampton Island. Bylot and Baffin in 1614 penetrated through Davis's Strait and explored Baffin's Bay to its most northern extremity, called Sir Thomas Smith's Sound (78° N. lat.). In returning along the western shores of Baffin's Bay, they passed the wide opening of Lancaster Sound (between 73° and 75° N. lat.), but considered it a closed bay. As their researches had been made with great care, Baffin was of opinion that all attempts to find a North-West Passage in these parts were useless, and this opinion soon became so prevalent as to put a stop to all voyages of discovery in this direction. The voyages were now directed only to the exploration of Hudson's Bay, and were prosecuted with less ardour. In 1631 James discovered James's Bay, the most southern part of Hudson's Bay, and Fox again examined the two straits which enclose the island of Southampton, Roe's Welcome, and Fox Channel. More than a hundred years later, in 1741, Middleton explored Wager River and Repulse Bay, to the west of Roe's Welcome, and found that both were closed inlets.

While the English were pursuing their discoveries on the north-eastern shores of North America nearly without interruption, the Spaniards made some feeble attempts along the north-western coast with the view of finding a North-West Passage. Their voyages led to no important result, except that two of their navigators pretended that they had discovered the passage. Juan de Fuca is said to have entered a large bay between 47° and 48° N. lat., and to have sailed through a strait in a north-eastern direction until he reached the Atlantic Ocean. He sailed from Acapulco in Mexico, and returned to that place. Admiral de Fonte is said to have entered, in 1640, a broad navigable inlet, situated in 53° N. lat., which led him to an inland lake of great dimensions, and thence to the Atlantic. The short accounts which exist of these voyages were not printed in England till a long time after their pretended performance, and it must be observed that the Spanish government never admitted that the voyages had taken place; a fact which at that time was attributed to the jealousy which prompted the Spaniards to exclude all foreigners from their possessions in America. Humboldt, in his work on Mexico, says, that after the most careful researches in the archives of Mexico, he was unable to find any document in which Juan de Fuca or the Admiral Bartolomeo de Fonte was even mentioned. The accounts of the voyages, attributed to these navigators, are evidently fabrications, invented for the purpose of appropriating to the Spanish nation the honour of the discovery, if such a passage should ever be found. Juan de Fuca had certainly visited the north-western coast of America; the southern strait by which the island of Quadra and Vancouver is separated from the continent still bears his name.

When the distinguished navigator Cook entered on his last voyage of discovery, he was instructed to try how far he could advance northward between Asia and America. He reached Icy Cape (70° N. lat.), where he found that a barrier of ice extended from one continent to the other. In the same voyage he visited several parts on the western coast of North America, and found that on the western side too the rocky shores were indented by numerous inlets. The nearly forgotten fabrication of Juan de Fuca was again discussed, and the English as well as the Spaniards soon after sent several expeditions to survey these coasts. After a close examination of the whole coast north of 45° N. lat., it was ascertained that it consisted mostly of islands, separated from the continent by narrow sounds, and that the numerous inlets by which the continent itself is indented do not extend far inland, and terminate at the foot of elevated mountain-ranges.

The question as to the existence of a North-West Passage now seemed to be decided in the negative, when the whalers who annually visit the sea on both sides of Greenland reported that in the years 1816 and 1817 the arctic seas were much less encumbered with ice than had ever been observed. The British government now resolved to make an attempt to settle this question. In 1818 two vessels were despatched, under the command of Captain John Ross and Lieutenant Parry, to re-examine the shores of Baffin's Bay. All the bays and inlets which these navigators entered were closed by mountains or ice, and Captain Ross was also of opinion that this was the case with Lancaster Sound (between 73° and 75° N. lat.), and that a North-West Passage did not exist in these quarters. But Parry thought that the last-mentioned inlet had not been examined with sufficient care, considering its great width. Parry was sent in the following year (1819), for the purpose of examining Lancaster Sound more closely than had been done by Captain Ross. On entering the sound he sailed in a westerly direction 30 degrees of longitude, or 540 miles, having on the north a series of elevated tracts, broken apparently into islands by intervening channels. These channels were not examined, and may perhaps turn out to be only bays. The larger of these islands were named by him respectively Cornwallis, Bathurst, and Melville Island. On the south side of the sound were two large islands, of which the eastern was called Cockburn Island; the western remained nameless, as it was supposed to form a part of the American continent. The channel which divides these two islands received the name of Regent's Inlet. West of 100° W. long. no land was in view on the south. Parry and his crews passed the winter on Melville Island, hoping in the following summer to reach the Pacific. He was unable however to advance west of Melville Island, the sea being covered with thick and impenetrable ice; but no land was in sight, except that at a great distance to the west-south-west there appeared a bold coast, which was named Banks's Land. It was now clear that it was only owing to the series of islands which skirt the northern shores of this long strait that they had been enabled to proceed so far westward, and that the sea ceased to be navigable where these islands terminated.

All hope of reaching the Pacific by Lancaster Sound being frustrated, Parry proposed to try if the object could be effected by any of the inlets which open into Hudson's Bay, the northern portion of which had not been explored. In 1821 he entered that bay, and passing between Cumberland Island and Southampton Island, he advanced to Repulse Bay, which he examined and found to be completely enclosed, as Middleton had described it. He then explored a part of the contiguous coast to the northward, in which he found another large indentation, which he called Lyon's Inlet. His vessels were soon afterwards frozen up in the midst of the sea, near Winter Island (66° N. lat.). In the following summer he continued his voyage northward, and discovered the whole coast between 65° and 70° N. lat., in which no deep indentation occurred, with the exception of a wide sound between 69° and 70°, which he explored for more than 60 miles, when he found that it was closed by a barrier of ice, lying south and north across the strait, but he ascertained that beyond this barrier there was an open sea, a circumstance which agreed with the information that he had obtained from the natives. This opening therefore was not a bay, but a strait, which he called, after the two vessels under his command, Fury and Hecla Strait. At the time of this discovery the season was far advanced, but he hoped to be able to reach the open sea west of the strait the following summer, and accordingly he passed the second winter on the island of Igloolik, at the eastern extremity of the strait. But though he waited to the middle of August in the following year, the strait continued to be covered with ice, and he was obliged to give up all hope of effecting his purpose.

The result of this attempt showed that Fury and Hecla Strait did not allow a navigable North-West Passage. Parry, whose success had deservedly secured the confidence of government, again obtained the same vessels for the purpose of trying whether Regent's Inlet, which, according to the

information obtained from the Esquimaux, stretches far to the south, might not allow a passage. On arriving at the entrance of Regent's Inlet, he found it much encumbered with ice, and was obliged to pass the winter from 1824 to 1825 in Port Bowen, on the western coast of Cockburn Island. In trying to sail southward the following July, one of the vessels (the Fury) was lost in the ice, and Parry returned home in the Hecla. Government did not think fit to continue these voyages, which led to no definite result; but as the last attempt of Parry had been merely interrupted by an accident, it seemed still probable that a navigable North-West Passage might exist through Regent's Inlet. A wealthy individual, Sir Felix Booth, furnished all the expenses for a new adventure, the direction of which was given to Captain John Ross, who, after passing through Lancaster Sound, entered Regent's Inlet in 1829, and sailed along the western shores of the inlet as far south as Felix Harbour (70° N. lat.), where he passed the winter. The following seasons were unfavourable, the sea being constantly encumbered with heavy ice, and he was obliged to remain nearly on the same spot two more winters. This circumstance gave him an opportunity of examining the adjacent countries, and he found that the country west of Regent's Inlet was not an island, but joined to the continent of America by a low isthmus of inconsiderable length and width. It is however supposed that a strait actually exists in this part, which escaped his research. The peninsula which Ross considered to be united by the low isthmus to the continent of America was called by him Boothia Felix. The shores of the continent itself, west of the isthmus, were examined to a distance of 70 miles, and the most western cape which was reached was called Victory Point (69° 46′ N. lat. and 98° 33′ W. long.). In another excursion the Magnetic Pole was found to be in 70° 5″ N. lat. and 96° 46′ 45″ W. long. Not being able to extricate his vessels from the ice, Captain Ross and his crew returned in 1832 in boats to Hudson's Bay, where they were received on board of a whaler.

The only North-West Passage the existence of which is certain, is the long strait which is connected with Baffin's Bay by Lancaster Sound. This strait ought, in conformity with the precedent of Magalhaens, to be called Parry's Strait. Since however its western extremity is always blocked up with ice, it never can be available for the purposes of navigation. Still it is not improbable, as already mentioned, that another strait divides Boothia Felix from the continent of America. This hitherto unknown strait has lately attracted a great deal of interest, as being connected with the northern termination of the American continent. The whole line of coast between Behring's Strait and the mouth of the Mackenzie river is now known. Between the discoveries of Captain Beechey, who advanced to Point Barrow (71° 28′ N. lat. and 156° 10′ W. long.), and those of Sir John Franklin, who went as far as Point Beechey (70° 30′ N. lat. and 150° W. long.), only a coast-line of about 130 miles remained undiscovered, and this tract was explored, in 1837, by Messrs. Dease and Simpson, agents of the Hudson's Bay Company. (*London Geo. Journ.*, vol. viii.) East of the Mackenzie river the coast-line as far as Point Turnagain (near 109° W. long. and 68° 30′ N. lat.) was discovered by Sir John Franklin and Doctor Richardson, and the distance between this cape and the Point Victory of Captain Ross does not much exceed 300 miles. Dease and Simpson advanced to 106° W. long. in 1838 (*London Geographical Journal*, vol. ix.), so that the whole distance now unexplored does not much exceed 200 miles. Captain Back, in his expedition in search of Captain Ross, found a sea between 67° and 68° 30′ N. lat. and 95° and 97° W. long. Back observed a pretty strong current setting eastward, which is the strongest argument for presuming that a strait exists in these parts, probably to the south of Point Victory. If the Hudson's Bay Company continue to encourage their agents, in a few years more we shall be acquainted with the whole extent of the American continent towards the north, and the question respecting the North-West Passage will be finally settled.

It is evident that the great advantages which were once expected to accrue from the discovery of a North-West Passage, can never be realised, and it is even doubtful whether such a passage will be of any use at all. Even if the yet undiscovered portion of it should be navigable, that portion which we already know is totally unfit for navigation during the whole year. Between the mouth of the river Mackenzie and Barrow Point, the most northwestern cape of America, the sea, even in August and September, is so encumbered with ice, that in some parts it is impossible to advance in large boats. It is certain that a trading vessel will never find its way through that frozen sea. Still we are inclined to attach some importance to the discovery of that passage, not only as a geographical question but also in a practical point of view, simply because we can never form a just idea of the usefulness of anything before it is known.

(Barrow's *Chronological History of Voyages into the Arctic Regions*; *Voyages* of Ross and Parry; Franklin's *Expeditions to the Polar Regions*; *London Geogr. Journal*, vols. v., viii., and ix.)

NORTH-WESTERN TERRITORY is a term frequently used to designate a part of the territory which lies to the west of the Chippewyan or Rocky Mountains, in North America. No general name has yet been given to the countries, which extend along the Pacific, from Cape Mendocino (near 40° N. lat.) to Behring's Strait (north of 65° N. lat.) and the Icy Sea, and occupy the space between the Pacific and the Chippewyan Mountains. We shall however give a short description of these countries under this head.

The Chippewyan or Rocky Mountains run from the mountain-knot of the Sierra Verde (between 40° and 42° N. lat.), in a general north-north-western direction, through twenty-five degrees of longitude (from 110° to 135° W. long.) until they terminate at the mouth of the Mackenzie river (68° N. lat.). The most eastern range of this extensive mountain-system constitutes the eastern boundary of the region in question. The shores of the Pacific, which bound it on the west, run (between 40° and 45° N. lat.) nearly due north, and gradually approach the mountains. The distance between them may on an average be estimated at 670 miles, until they reach the Sound of Juan de Fuca (47° N. lat.), where they are only about 400 miles distant. From this sound the coast trends north-north-west, and runs parallel to the Chippewyan Mountains to Behring's Bay (60° N. lat.), preserving a distance of about 380 miles from them. From Behring's Bay the coast-line turns westward, and runs in that direction more than 700 miles. This latter coast is parallel to the coast-line of the Icy Sea, which is ten degrees farther north, and thus the north-western extremity of North America forms an extensive peninsula, nearly 700 miles in width and more than 700 long, which terminates on the west in projecting headlands on the shores of the Kamtchatka Sea, Behring's Strait, and the Icy Sea.

According to a rough estimate, the area of this region is above 1,000,000 square miles, which are thus distributed:—The southern region (between 40° and 47° N. lat.) is on an average 670 miles wide from east to west, and about 480 miles long; the area is 300,000 square miles. The central region (between 47° and 60° N. lat.) is about 900 miles long and 380 miles wide: the area is 300,000 square miles. The northern peninsula measures 700 miles from south to north, and more than 700 miles from east to west: the area is 500,000 square miles. The total area is 1,100,000 square miles, which is equal to the basin of the Mississippi river.

Cape Mendocino, which may be considered the most southern extremity of the *Southern Region*, rises from the sea with a steep ascent to a great elevation. It consists of bare rocks, furrowed by deep clefts and narrow valleys, which are the only portions of this mountain-mass that are wooded. The coast north and south of this cape to a distance of several miles has the same character, though it is not quite so high. It is supposed that Cape Mendocino is the western extremity of an elevated mountain-range which runs eastward to the Chippewyan range, and joins it at the mountain-knot of the Sierra Verde. This supposition is founded on the information that this tract contains the watershed between the numerous tributaries of the Columbia river, and the Rio S. Sagramento or Buonaventura, which falls into the Bay of S. Francisco [CALIFORNIA], and the Rio Colorado [MEXICAN STATES]. Another range runs northward from this transverse chain, about 150 miles from the sea, to the Columbia river: it attains a considerable height, and about 50 miles from the banks of that river rises in Mount Hood to the height of about 15,900 feet. This range approaches close to the river, and produces the rapids and waterfalls which are called the Long Narrows. The mountain-chain is continued north of the river to the Sound

of Juan de Fuca, where one of its summits, Mount St. Helen's, is 14,400 feet high. This range divides the more fertile portion of the southern region from that which is sterile. The country west of the range is in general covered with trees. Along the western declivity of this range is the Columbia valley, which is 60 miles wide towards the north, and extends far to the south: its southern districts have not been explored. It is a country of great beauty: the surface is intersected with numerous small lakes and pools, and exhibits great luxuriance in its extensive meadows and fine forests. The river Wallámot, or Wallamatto, runs through this valley. A range of high hills runs on the west of the valley, and from this range to the shores of the Pacific there is a mountainous country, but it is in general covered with dense forests of hemlock, spruce, white and red cedar, cotton-wood, white oak, and some other kinds of trees. These forests extend to the shores of the sea, which are rocky and precipitous, and generally bare. This mountainous country approaches the Columbia river on the south, about 70 miles from its mouth, and compels it to change its western into a north-western course. The banks of the river where the mountains border it are often high and rocky, with low marshy islands at the base of the banks, which are subject to inundation, and covered with willows, poplars, and other trees. In other places the mountains recede from the river, leaving between their base and the stream beautiful plains, which are covered with tall trees. These lower tracts and the declivities of the adjacent mountains are overgrown with deciduous trees; but the more elevated part of the uplands is covered with majestic pines and firs, some of which tower to the height of between 200 and 300 feet. Where the Columbia valley opens on the Columbia river, the banks are occasionally marshy, and covered with so dense a growth of shrubs and rushes as to be almost impassable. Where the elevated range of Mount Hood comes up to the river, the banks consist of stupendous precipices covered with fir and white cedar.

East of the range which contains Mount Hood the country is an inclined plain, rising gradually towards the east, south-east, and north-east, until it joins the base of the Chippewyan Mountains. This tract, which is about 150 miles wide, is an uneven plain, on which level tracts of great extent alternate with ridges of moderate elevation. The soil of the level grounds consists chiefly of gravel and sand, interspersed with bare rocks. These plains are nearly as destitute of vegetation as the country along the eastern base of the Chippewyan Mountains. The hills extend in ridges running south and north, and generally consist of an indurated clay: they exhibit few signs of vegetation, and are very rarely covered with forests, except on the more elevated parts, where they are clothed with scrub pines and cedars, aspens, a small kind of cotton-tree, and some shrubs.

The Chippewyan Mountains, which lie to the east of this desolate region, seem to consist principally of two elevated ranges running parallel to one another at a distance of less than 100 miles: in several places they are united with one another by short transverse ridges. In some places the eastern range rises to the snow-line. There occur in it several depressions, where the upper branches of the Missouri and Columbia approach near one another, and some few of them present no obstacle to the passage of wheel-carrriages. The western range does not appear to rise so high, and in several places contains depressions, which allow a passage for the waters that collect from both ranges, and constitute the principal branches of the Columbia river. Not far from the source of the Snake river, in this range, there are three high summits, called the Three Breasts, or Têtons, which stand on a common base, which is perforated by deep caverns, by which several small rivers pass under the mountains southward, and join the Snake river. The mountains of the Chippewyan range are generally barren; but the intervening valleys contain several fertile tracts, which are partly covered with high trees and partly with fine grass.

The country enclosed by the two ranges of the Chippewyan Mountains must have a great elevation, which is proved by the circumstance of the great rapidity of all the rivers which join the principal branches and tributaries of the Columbia river. Their course is in general a succession of rapids and cataracts, which sometimes continue without interruption for 50, 80, or even 100 miles. The navigable parts of these rivers are of less extent than those which are quite unfit for navigation. The Long Narrows occur in the Columbia river about 180 miles from its mouth, and occupy 80 miles of its course. They begin with a perpendicular cascade of 20 feet, after which there is a rapid descent for a mile between islands of hard black rocks to another fall of 8 feet, which is divided by two rocks. About 2½ miles below this fall the river expands into a broad basin, from which the water escapes by a chasm only 45 yards wide. Through this narrow passage the whole body of the river swells and boils for some distance in the wildest confusion. Lower down there are several rapids, and the river is again compressed into a channel from 50 to 100 feet wide, which is worn through a rough bed of hard black rock, along which it rushes with great fury, and from which it escapes by the second great fall, over a ledge of rocks 20 feet high, and extending nearly from shore to shore. The river is navigable for large barges up to the Long Narrows, there being no impediment farther down. At Vancouver Fort, more than 100 miles from its mouth, the tide is still perceptible, and vessels of between 200 and 300 tons can ascend to this point.

A country which rises with a steep ascent from the sea more than three thousand feet in a distance of about 300 miles, and of which about one-half is exposed to the influence of the Pacific, must have great differences of climate. We are only imperfectly acquainted with the climate along the coast; but we know that it resembles the western countries of Europe rather than those parts of the United States which are on the Atlantic. The winters are not rigorous nor the summers sultry. There is little snow, and it generally melts while it falls: it rarely remains more than two days on the ground, except on the mountains. The winters are more characterised by rain than cold. From the middle of October to the middle of March the rains are almost incessant, and are accompanied with tremendous thunder and lightning. The winds which prevail at this season are from the south and south-east, and they usually bring rain; while those from the north and north-west bring fair weather and a clear sky. From the middle of March to the middle of October the weather is serene and delightful; only a few showers of rain fall, but in the morning the dews and fogs are very heavy. As to the interior of the country, we only know that the winters are severe, but the quantity of snow is not great; and during the summer there is frequently a want of rain, which is probably the main reason of the sterility of this part of the country.

The interior of the country is inhabited by several Indian tribes, among which the Flat-heads, on Clarke and Columbia rivers, and the Snake Indians, or Shoshonees, on Lewis river, are the most numerous. They have many horses and dogs, and live chiefly on the produce of the chace. They frequently resort to the countries east of the Chippewyan Mountains to hunt the buffalo, which is not found west of the range. The smaller tribes, which inhabit the country along the Pacific, gain their subsistance by fishing. Several kinds of fish abound in the rivers, especially sturgeon, salmon, and a smaller kind of salmon called *uthlecan*. The wild animals are the deer, black and grizzly bear, a species of antelope, the ashata or big-horn, the beaver, the sea and river otter, the musk-rat, fox, and wolf: the puma is sometimes met with. This seems to be the most northern country on the western side of America where the puma is found. On the eastern side of the United States it is met with in the Essex Mountains, in the state of New York.

The *Central Region*, which extends along the coast from the Sound of Juan de Fuca to Behring's Bay, is still less known, with the exception of the coast and the numerous islands which skirt it. Though the Hudson's Bay Company has of late years formed several establishments in the interior, and particularly south of 55° N. lat., we possess little information respecting its natural capabilities. The Chippewyan Mountains continue to form two ranges, about 100 miles from one another. The eastern range, south of 55°, is by far the more elevated, and contains many snow-capped summits, among which Mount Hooper rises to 15,690 feet, and Mount Brown to nearly 16,000 feet. Its general elevation seems to be above the vegetation of trees. It does not appear that there are any deep depressions in this part of the range. No part of the western chain attains the snow-line. Between these ranges is the valley of the Upper Columbia river, which finds its way through a deep break

in the western range, which it traverses with numerous rapids and cataracts. North of 55° N. lat. both ranges seem to be of nearly equal height, and both of them are in several places covered with perpetual snow. The western range constitutes one uninterrupted mass of mountains, but the eastern is broken by some narrow clefts, through which the rivers carry off the water that is collected in the valleys between the two ranges. Two large rivers, of which the southern is called the Peace river, or Unjigah, and the northern the Southern Branch of the Mackenzie river, or Turnagain, drain the valleys enclosed by the two ranges and their offsets between 55° and 60° N. lat., and after traversing the eastern range by narrow valleys, they enter the great plain east of the Chippewyan Mountains; the Peace river falls into the Slave river, and the Turnagain river into the Mackenzie river. The valleys which are drained by the upper courses of the Columbia, Peace, and Turnagain rivers are probably still more elevated than those of the southern tributaries of the Columbia river. Mackenzie experienced a great degree of cold in June on the Peace river, even at the place where it breaks through the mountain-range. Mountains which rose only 1500 feet above their base were then covered with snow. The valleys contain very little level ground along the watercourses. At a short distance from the banks of the rivers there are high rocks, from the summit of which level plains extend to some distance, but most of these river-basins have a broken surface. The rocky masses advancing in the form of ridges, from both ranges, to the very banks of the rivers, are only furrowed by narrow valleys, in which the rivers run between steep rocks; these valleys are almost entirely covered with wood. In the lower tracts along the rivers there are willows and alders, and on some detached spots there are spruce and white birch. The uplands are principally covered with pines, cypress, spruce, and a few other trees. None of these valleys are inhabited, and only a few natives resort to them in summer and in the earlier part of autumn. They abound in beaver and moose-deer, and in some tracts rein-deer are found. Mackenzie saw a humming-bird on the Peace river, near 54° 30′ N. lat., which appears to be the northern limit of this bird: swans, geese, and ducks are numerous, but fish is not plentiful.

The country which begins at the base of the western range of the Chippewyan Mountains, and extends westward for about 80 miles from the sea, occupying on an average a width of more than 100 miles, may be considered as an uneven plain. Rocky ridges of moderate elevation run through it in every direction, but they are generally at some distance from each other, and the intervening plains are of considerable extent. The surface of these plains, which in many places is level, and in others undulating and hilly, is at a considerable elevation above the sea-level, which is shown by the deep depression of the streams, and by their very rapid course. A considerable portion of this plain is covered with swamps and lakes. The smaller lakes seem to be very numerous, and some of them are of great extent. According to a vague estimate, it is said that perhaps one-fifth of this plain is covered with water. Though the bare rocks often appear on the surface, they do not occupy a large portion of the country, it being generally covered with trees of heavy growth. The climate of this plain seems to be characterised by great humidity. When Mackenzie crossed it in June and July, he had merely two or three days of fine weather in succession, and it sometimes rained several hours for many days together. To this excessive humidity of the atmosphere we may probably ascribe the vigorous vegetation of this country. The forests, which cover nearly the whole region, and consist chiefly of pine, hemlock, cypress, spruce, white birch, and poplar, contain a great number of excellent timber-trees; the underwood, which is dense, consists of many fine shrubs. These forests contain many fur-bearing animals, especially beavers and otters. Several species of deer, with the moose-deer and the ground-hog, are abundant. The natives, who appeared to Mackenzie to enjoy a greater portion of comfort than the tribes east of the Chippewyan range, live in convenient houses, and gain their subsistence mainly by fishing. The rivers abound in several kinds of fish, particularly salmon and trout.

Fraser river runs through nearly six degrees of latitude, and its course is probably 500 miles. It is called by the natives Tacoutche Tesse, at least in the upper part of its course. It rises near the source of Peace river, and runs southward, but towards its mouth it turns west, and falls into the Sound of Juan de Fuca. Though its course is rapid, it is navigable for canoes, except where it is interrupted by cataracts. There are several establishments of the Hudson's Bay Company on its banks.

Along the coast of the Pacific the country is mountainous, and occupies a width probably of 80 miles. Between the mouth of Fraser river and Smith Inlet, a distance of more than 200 miles, it appears to constitute one uninterrupted mass of high mountains, the declivities of which extend to the shores of Queen Charlotte Sound, which separates the large island of Quadra and Vancouver from the continent. Farther north it occurs in more isolated masses, the openings between which are occupied by inlets extending thirty miles into the rocky masses, and by wide valleys, through which the rivers discharge their abundant waters into these inlets. The higher part of these mountain-masses, which generally occurs between 30 and 40 miles from the sea, rises above the snow-line, and in many parts the icy masses which cover the summits form glaciers, which occupy a considerable part of the declivities. Several of these mountains appear to be of volcanic origin, but active volcanoes are not so common as in the region which skirts this coast toward the north. The shores of the Pacific are high, and rise with a steep ascent from 300 to 700 feet, and in many places still higher. At a short distance from the shores the mountains attain a great elevation. The climate along the coast is extremely mild, the rivers not being covered with ice before the middle of January; but it is also very humid, in consequence of the western and south-western winds, which blow from the Pacific nearly all the year round, and, passing over an immense expanse of water, absorb much moisture, which descends in rain when the winds reach the high mountains that extend along the shores. The vegetation is extremely vigorous. The cypress and pine trees, which cover the western declivities of the mountains, attain a greater height and size than in any other countries: some have measured above 30 feet in circumference. The natives of this tract seem to form a numerous tribe, known by the name of the Wakash Indians. Mackenzie found them living in large and commodious houses, and in the enjoyment of many comforts. They live mostly by fishing, as their rivers abound in various kinds of fish, especially salmon, which are taken in weirs constructed with great ingenuity. The sea-otter is very common along the whole of this coast, which has been visited of late years by European vessels for the purpose of procuring the skins, which fetch a high price at Canton.

The islands which skirt this coast partake strongly of the natural features of the adjacent continent. They consist of high mountains, which for the greater part of the year are covered with snow: their shores are rocky and high; and they are only partially covered with forest-trees. The most southern and largest of these islands is that of Quadra and Vancouver, which has an area of more than 13,000 square miles, or about half the area of Ireland. The strait which divides it from the continent varies between two and ten miles in width, and is called Queen Charlotte Sound. On the western side of the island, or rather on an island separated from it by a narrow strait, is Nootka Sound. [Nootka Sound.] The islands which lie farther north along the coast are generally of moderate size. The largest are Aristizabali, Prince Royal, Banks, and Revillagigedo Island. About 50 miles west of Banks Island is Queen Charlotte Island, which has an area of about 10,000 square miles. Farther north is King George III. Archipelago, which comprehends a considerable number of large islands. The largest is Prince of Wales Island, on the western shores of which is Port Bucarelli, a fine and safe harbour surrounded by a range of high mountains, containing seven active volcanoes, from which fire and smoke issue in the midst of eternal ice. The largest of the other islands belonging to this archipelago are Sitka, Duke of York Island, and Admiralty Island. This chain of islands terminates at Cross Sound. North of Cross Sound a very high and lofty range runs along the shores, and its highest summit, Mount Fairweather, attains the elevation of 14,781 feet above the sea-level. This range extends to Behring's Bay. The climate of these islands is still more humid than that of the opposite coast. On the island of Sitka the harbours are open all the year round, though the small creeks which are enclosed by hills are sometimes covered with a thin coat of ice. A little snow falls in January and February, but heavy showers of rain

occur daily all the year round. Thunder-storms are rare in summer, but more frequent in winter. In winter the air is so charged with electricity, that for many hours together in the darkest nights a bluish green electrical light is seen on bars of iron which are exposed to the air. The attempts which have been made to cultivate grain have not succeeded. Though maize and wheat grew well at Nootka Sound, they did not ripen. Potatoes and several kinds of vegetables succeed well. The wood which covers the lower declivities of the hills and mountains consists chiefly of different kinds of fir, cypress, and balsam poplar; they are sometimes of great size. Whales, seals, sea-lions, and otters of different kinds abound.

The *Northern Region*, or the large peninsula which stretches between 60° and 70° N. lat. from 130° W. long. between the Pacific and the Polar Sea, and terminates at about 166° W. long. on the shores of Behring's Strait and the sea of Kamtchatka, is the least known portion of the north-western coast of America. It is only the shores and their immediate vicinity which have been visited, and up to the year 1837 a part of the coast along the Polar Sea had never been seen by any European. Not far from Behring's Bay rises the high summit called Mount St. Elias, which is considered to be the highest mountain in North America, being 17,144 feet above the sea-level. It is connected by a lower ridge with the range of Mount Fairweather. At Mount St. Elias the mountain-mass, which so far north lies in a direction nearly due north-west, begins to run to the west, and continues in that direction to the shores of Bristol Bay, where it suddenly grows narrower, and forms the peninsula of Alashka or Aliaska, which is about 360 miles long, with an average width of 20 miles. It is not known to what a distance these mountains extend inland, as they have never been traversed by Europeans. Many of their summits rise above the snow-line, and several of them are active volcanoes, especially on the peninsula of Aliaska. The declivities of the mountains reach the shores of the sea, which are indented by numerous inlets.

The largest of these inlets are Prince William's Sound and Cook's Inlet, which enclose the elevated rocky peninsula of Tchougatchi. At the point where the peninsula of Aliaska is connected with the continent is the island of Kodiak, which is above one hundred miles long, and on an average fifty miles wide; it consists of rocky mountains of moderate elevation, with fine valleys between them. The climate along this coast is as humid and mild as farther to the south-east; snow does not lie long on the ground, and severe cold is not experienced. This is perhaps mainly to be attributed to the high mountains which shelter it from the north and north-east, and to the high ground of the peninsula of Aliaska, which extends west-south-west, and shelters the lower tracts from the north-west winds. Though the rocky coast, where it is exposed to the strong winds from the Pacific, is generally without vegetation, the shores of the inlets and the lower declivities of the surrounding mountains are clothed with fine timber-trees, fir, larch, poplar, silver poplar, alder, and willows. Earthquakes are common on the island of Kodiak and the adjacent coasts, as well as on Aliaska. The sea supplies the principal article of food for the natives; the most common fish are herring, cod, halibut, and salmon. Whales and seals abound. The fur-bearing animals, which have attracted the Russians to this coast, are sea and river otters, several kinds of foxes, among which the black fox is in high esteem, black, brown, and red bears, and several kinds of marmots, besides beavers, rein-deer, gluttons, lynxes, and some smaller animals. In the mountains a kind of wild goat is found.

The peninsula of Aliaska and the chain of volcanic islands which stretch from the extreme western point of the peninsula nearly to the shores of Kamtchatka, separate the sea of Kamtchatka from the Pacific. North of the peninsula is the Bay of Bristol, into which a river falls that brings down the water from the large lake of Shelekew. This lake is said to be nearly one hundred miles long, and about forty wide in the broadest part. In the vicinity of this lake the high mountains seem to terminate, or at least to remain at a great distance from the shores of the sea; for between Bristol Bay and Norton Sound the coast is low and inaccessible, the sea being shallow and the waves breaking upon the land. A considerable river, the Kuskowim, empties itself into the sea between Bristol Bay and Norton Sound; and north of its mouth is the island of Nunivak, which is above one hundred miles long, and of moderate elevation. On the shores of Norton Sound the country is low, but rises with a gentle ascent towards the interior. Cook found it well wooded in parts; and this seems to be the most northern place on the west side of America where trees attain a considerable size. Farther north the country is low, but in many places intersected with hills of clay, sandstone, and limestone, of moderate height.

The innermost recess however of the deep bay called Kotzebue's Sound appears to reach a country of primitive formation. At the innermost recess of this bay is a hill composed of pure solid ice, about 160 feet high. Over the ice there is a covering of bluish clay, from two to three inches thick, and immediately over that a kind of turf scarcely a foot deep: it is overgrown with most luxuriant grass. The teeth and bones of the fossil elephant are found imbedded in the ice, as in the similar masses of ice which occur in the Polar Sea on the coast of Siberia. The country which surrounds the isolated hills of this region is low and level, and partly covered with swamps, and the shores in many parts are lined with narrow lakes. The soil is either sandy, or composed of an elastic bog earth, on which some small plants and shrubs thrive well near the water-courses; but at no great depth below, the ground is frozen even in the beginning of the autumn. Cape Lisburne is formed by a limestone rock about 850 feet high, and some hills extend from it to Cape Beaufort. Farther on to Icy Cape, and thence to Cape Barrow, the country is low, intersected with small lakes, and covered with swampy moss. The animals which abound in this region are several species of foxes, among which the black fox is abundant, and also several species of *viverræ* and *glires*. The dog is the only domestic animal, and the rein-deer is in a wild state. Otters and some marine animals, which occur farther south, disappear north of the Aleutian Islands, but the common seal is frequent, and the herds of morse in Behring's Strait are countless; their teeth form a considerable branch of trade. These seas contain six species of whales and four species of dolphins. The inhabitants of the shores of the Kamtchatka sea seem to belong to the Esquimaux, and greatly resemble the inhabitants of the north-eastern shores of Asia, the Tschukutskoi; their languages seem also not to differ materially: they live exclusively by fishing.

Point Barrow, the most northern point of America on this side, is a long low spit, composed of gravel and loose sand, which the pressure of the ice has forced up into numerous masses, which at a distance appear like rocks. It projects several miles into the Polar Sea. From this point eastward to the mouth of Mackenzie river the coast declines a little to the south of east. This coast is low, consisting in many places of mud, the surface of which is frozen even in summer; and in other places of mud-banks rising from ten to twenty feet, except towards the mouth of the Mackenzie river, where they attain from sixty to eighty feet. The sea is very shallow, and covered with ice, either in pieces or extending in large unbroken sheets. In many places an open channel lies between the coast-line and the sea, which may be navigated by small boats, but in other parts the heavy ice is closely packed on the shore. The country adjacent to the coast is level and low from Point Barrow to nearly 152° W. long., a distance of more than one hundred miles, and the eye does not meet with a single hill. It appears then that the whole tract between Cape Lisburne and 152° W. long. is an alluvial plain, in which ice is found all the year round at a small depth below the surface. Between 151° and 152° W. long. there is a ridge of hills at no great distance from the shore, called Pelly Mountains. It is not known if these hills form the most western range with which the Chippewyan Mountains terminate, or if they constitute an isolated range. No range of mountains or hills is visible from the shore between 151° and 146° W. lat., a distance of more than one hundred miles. But from 146° W. lat. to the mouth of the Mackenzie river four distinct ridges are seen at a distance of from twelve to thirty miles from the shore. They are probably the northern extremity of the Chippewyan Mountains, and seem to indicate that this mountain-system towards its northern extremity consists of four separate ranges, divided from each other by valleys about twenty or thirty miles wide. The two most western chains, called Romanzow chain and British chain, are covered with snow, even in summer: the two others are free from snow in summer. These chains consist of slate rocks; their summits are round and naked, and between them are narrow valleys which contain grass. No bushes nor even shrubs are met

with, and the few families of Esquimaux live on the produce of their fisheries.

The countries described under this head are claimed by three powers, the United States of America, the British, and the Russians. The Americans claim the country traversed by the Columbia river. By the convention with the Russians in 1824, their claims are limited to 54° 40′ N. lat.; but they claim all the country south of that parallel to 42° N. lat. The British however claim part of this coast. The Americans rest their claim partly on the discovery of the mouth of the Columbia river by Gray in 1792, though it appears that it had been visited in 1775 by the Spaniard Eceta, who called it Entrada de Eceta. Lewis and Clarke, two Americans, first crossed the country drained by the southern affluents of the Columbia river, but the principal branch was first visited by the agents of the Hudson's Bay Company. The opposite claims of the two nations are not yet settled. The Americans have formed no permanent settlements, but many of their citizens, who are engaged in the fur-trade, visit the southern affluents of the Columbia, as the most convenient mountain-passes over the Chippewyan range are between the upper branches of the Missouri and Lewis and Clarke rivers, but they complain much of the agents of the Hudson's Bay Company, who have permanent establishments on the Fraser river, and even on the Columbia itself. The British pass the Chippewyan Mountains between the sources of the Peace and Fraser rivers, which are only separated by a portage of 817 yards, according to Mackenzie. The claims of the Russians and the British have been settled by treaties, according to which the whole of the northern peninsula west of 141° W. long. belongs to the Russians, as likewise a tract along the coast as far south as 56° N. lat., and the greater part of the islands forming King George III. Archipelago. The settlements of the Russians are more important than the British. In 1799 a Company was incorporated under the name of the Russian American Company, for the purpose of trading along the north-western coast, and of hunting the fur-bearing animals, especially the sea-otters. Their most northern settlement is at Bristol Bay, at the mouth of a river called Nushagak. The establishment on the island of Kodiak, called Alexandria, is still more important. But the principal settlement is New Arkhangelsk, on the island of Sitka, where a town, with about 1200 inhabitants, has been built on a good harbour. The number of persons who are considered as Russian subjects amounts to more than 10,000, but only about 1500 are Europeans.

(Lewis and Clarke's *Travels to the Source of the Missouri*, &c.; Irving's *Astoria*; Mackenzie's *Voyages through the Continent of North America to the Frozen and Pacific Oceans*; *Voyages* of Cook, Meares, Portlock, Dixon, and Vancouver; Billing's *Expedition to the Northern Part of Russia*, by Sauer and Saryschew; *Voyage of Discovery to Siberia, the Frozen Ocean*, &c.; Langsdorf's *Voyages and Travels in various parts of the World*; Kotzebue's *Voyage of Discovery into the South Sea*, &c.; Beechey's *Voyage to the Pacific and Behring's Straits*; Franklin's *Second Expedition to the Polar Sea*; Dease and Simpson's *Account of the Recent Arctic Discoveries*, in the 'London Geographical Journal,' vol. viii.)

NORTH, FREDERIC, EARL OF GUILDFORD, better known by the title of *Lord North* (as he did not succeed to the earldom until within two years of his death), was born on the 13th of April, 1733. He was educated first at Eton, and afterwards at Trinity College, Oxford. On leaving the university, he went abroad for three years, and during that time resided successively in Germany, Italy, and France, cultivating the foreign languages. Almost immediately after his return to England, he married, in 1756, Miss Ann Speke, an heiress of an antient Somersetshire family.

In 1763 Lord North was appointed one of the lords of the treasury. Two years after, on the formation of Lord Chatham's (as it was called by Mr. Burke) 'tessellated' ministry, Lord North received the office of joint-paymaster of the forces, his colleague being Mr. George Cooke. In the speech in which Mr. Burke so happily described the general composition of this ministry, he thus specially alludes to the joint appointment of Lord North and Mr. Cooke:—'I venture to say, it did so happen that persons had a single office divided between them, who had never spoke to each other in their lives, until they found themselves, they knew not how, pigging together, heads and points, in the same truckle-bed.' (*Speech on American Taxation.*) Lord Rockingham had previously offered him the chancellorship of the exchequer and the vice-treasurership of Ireland, both of which appointments he had refused. He became chancellor of the exchequer in 1769, and at the same time leader of the House of Commons, on Charles Townshend's unexpected death. This too he at first declined; but he was afterwards prevailed on (we are told) by the princess of Wales and by his father, Lord Guildford, to accept this situation. In 1770, on the duke of Grafton's retirement, he became first lord of the treasury, still holding the chancellorship of the exchequer. George III. felt himself under an obligation to Lord North for extricating him, by the acceptance of the premiership, from the embarrassment which the duke of Grafton's retirement had caused; he warmly expressed his gratitude, became greatly attached to his new prime-minister, and never forgot the obligation, nor ceased to have a regard for him, till the coalition of 1784.

It is an interesting trait recorded by his daughter, Lady Charlotte Lindsay, in her letter appended to Lord Brougham's 'Historical Sketches' (first series), that Lord North would never allow himself to be called prime-minister. 'He never would allow us to call him prime-minister, saying there was no such thing in the British constitution.'

Lord North's ministry lasted from 1770 to 1782. Being defeated on the 22nd February, 1782, in the House of Commons, on the question of the continuance of the American war, he gave way to Lord Rockingham. That war is the chief characteristic of his ministry. There are two different questions to be considered in connection with this war, the question of its justice and the question of its expediency. The ministry and the opposition joined issue on both these questions. The opposition, including, with the exception of Lord North himself, and his supports Thurlow and Wedderburn, nearly all the intellect of the House, Burke, Fox, Dunning, and latterly Pitt (who entered parliament in 1780), contended, first, that the British parliament had no right to tax the American colonies, and therefore that a war in enforcement of British taxation was unjust; and secondly, that even if parliament had the right, it was inexpedient to enforce the right by war. Lord North maintained both the justice and the expediency of the war. But every year introduced of course new elements into the question of expediency; and it is now understood that Lord North himself disapproved of the continuance of the war for at least three years before his resignation in 1782, but that he persevered in its defence only in deference to the wishes of George III. Lady Charlotte Lindsay, in the letter already quoted, says, 'Although I do not believe that my father ever entertained any doubt as to the justice of the American war, yet I am sure that he wished to have made peace three years before its termination.' This statement is not inconsistent with the fact that Lord North, in the very last speech that he ever made, defended the American war; and this circumstance again renders it improbable that he should ever have thought or admitted it to be unjust, as has sometimes been supposed.

The following remarks show the nature of George the Third's opposition to Lord North's retirement, and convey a just censure on the conduct of Lord North:—'He was long resolved to quit the helm, because George III. insisted on a wrong course being steered—that helm which he ought to have quitted as soon as his mind was made up to differ with the owner of the vessel, unless he were permitted to follow his own course, and he was only kept at his post by constant entreaties, by monthly expostulations, by the most vehement protestations of the misguided prince against a proceeding which must leave him helpless in the hands of his implacable enemies, and even by promises always renewed to let him go, would he but remain for a few weeks, until some other arrangement could be made. It is fit that this certain and important fact should be stated, and we have before us the proofs of it under the hand of the royal suitor to his reluctant servant's grace and favour, whose apparently fixed purpose of retirement he uses all these expedients to defeat, or at least to obstruct and retard, if he cannot frustrate.' (*Historical Sketches of the Statesmen of George III.*, 1st series, p. 59.)

It was at the time the general opinion that Lord Bute retained his early influence with George III., and that Lord

North, nominally prime-minister, was but a puppet in his hands. [BUTE, LORD.] This opinion, which contributed greatly to the general unpopularity of Lord North's administration, has been shown by Lord Brougham to be entirely erroneous. (*Historical Sketches; Edinburgh Review* for October, 1839.)

The Rockingham ministry, which succeeded Lord North's, was soon followed by an administration under Lord Shelburne, in which Mr. Pitt was chancellor of the exchequer, and which placed Lord North by the side of his former adversary, Mr. Fox, in opposition. In a short time arose the well-known and much-abused coalition. [FOX.] In April, 1783, a ministry was formed by the duke of Portland, in which Lord North and Fox were appointed secretaries of state. This ministry ended its career in December of the same year. The universal unpopularity of the coalition, and the king's unconstitutional opposition to Mr. Fox's India Bill, killed it. We are informed by Lady Charlotte Lindsay that the coalition was principally brought about by the agency of Lord North's eldest son, and of Mr. Eden, afterwards Lord Auckland. In reply to the abuse which has been heaped upon this coalition, it may be observed, that because statesmen have once differed, they are not to be precluded from afterwards combining, when the questions on which they have differed are set at rest, and others have arisen in which they conscientiously agree; but it is not to be denied that this league, formed against the peace which Lord Shelburne had obtained, was hated by the whole country, and deeply injured the character of the parties. [FOX.]

When Lord North retired from the premiership in 1782, he had been appointed lord-warden of the Cinque Ports. He succeeded to the title of earl of Guildford and to the family estates in 1790. Two years after, he died, in the sixtieth year of his age. In the last five years of his life he was afflicted with blindness. 'Lord North, when he was out of office,' says his daughter, 'had no private secretary. Even after he became blind, his daughters, particularly the two elder, read to him by turns, wrote his letters, led him in his walks, and were his constant companions.'

Lord North was not a statesman of first-rate powers, but yet of more than respectable ability. His administration of the finances, in his character of chancellor of the exchequer, was generally approved of. And again, though he cannot lay claim to the title of a brilliant orator, he was a good speaker. He spoke clearly, sensibly, with much wit, and with an uniformly good humour, which made him the great favourite of the House.

The following are interesting passages of Lady Charlotte Lindsay's letter. After describing her father's social qualities, she observes, 'Yet I think that he had really more enjoyment when he went into the country on a Saturday and Sunday, with only his own family or one or two intimate friends: he then entered into all the jokes and fun of his children, was the companion and intimate friend of his elder sons and daughters, and the merry entertaining playfellow of his little girl, who was five years younger than any of the others. To his servants he was a most kind and indulgent master. If provoked by stupidity or impertinence, a few hasty impatient words would escape him, but I never saw him really *out of humour*. He had a drunken stupid groom, who used to provoke him, and who, from this uncommon circumstance, was called by the children "the man that puts papa in a passion;" and I think he continued all his life putting papa in a passion, and being forgiven, for I believe he died in his service.' And again: 'Lord North was a truly pious Christian; and although (from his political view of the subject) I believe that one of the last speeches he made in parliament was against the repeal of the Test Act, yet his religion was quite free from bigotry or intolerance, and consisted more in the beautiful spirit of Christian benevolence than in outward and formal observances. His character in private life was, I believe, as faultless as that of any human being can be; and those actions of his public life which appear to have been the most questionable proceeded, I am entirely convinced, from what I must own was a weakness, though not an unamiable one, and which followed him through his life—the want of power to resist the influence of those he loved.'

NORTHALLERTON. [YORKSHIRE.]

NORTHAMPTON. [NORTHAMPTONSHIRE.]

NORTHAMPTONSHIRE, an inland county of England, is bounded on the north by Lincolnshire, on the north-west by Rutlandshire and Leicestershire, on the west by Warwickshire, on the south-west and south by Oxfordshire, on the south-east by Buckinghamshire and Bedfordshire, and on the east by Huntingdonshire and Cambridgeshire. Its form is very irregular; its greatest length is, from north-east to south-west, from the neighbourhood of Peterborough to that of Brackley, 68 or 69 miles; and its greatest breadth, from the neighbourhood of Daventry to Stoney Stratford, 27 miles. Its area is estimated at 1016 square miles. The population in 1821 was 162,483; in 1831, 179,336; showing an increase in ten years of 16,853, or 10 per cent., and giving 177 inhabitants to a square mile. In size it is the twenty-second of the English counties; in amount of population the twenty-seventh; and in density of population the twenty-ninth. Northampton, the county town, is on the Nene, 61 miles in a direct line north-north-west of London, or 67 miles by the mail-road through St. Alban's, Dunstable, Woburn, and Newport Pagnel.

Surface and Geological Character.—The surface of the county is undulating; the hills do not rise to a great height, but present gentle declivities separated by intervening vales watered by rivulets and rivers, and so irregularly grouped as not to admit of description. The highest land is about Daventry, where Arbury Hill rises to the height of 804 feet above the level of the sea. This and the neighbouring hills have the general appearance of a group of rounded conical knolls, and constitute by far the most varied and picturesque scenery in this part of the county. The north-eastern extremity of the county, near Peterborough, subsides into the great fen district.

The eastern border of the county, comprising the heights east of the valley of the Nene, adjacent to Huntingdonshire and Bedfordshire, is occupied by the Oxford clay, which forms the separation between the middle and lower divisions of the oolitic series. The northern part of the county; the central parts, as far west as the hills which overlook the valley of the Welland by Harringworth Park and Rockingham, and as far to the south-west as the high road to Nottingham, through Higham Ferrers, Kettering, and Rockingham; the south-eastern border, from Higham Ferrers to Towcester and Brackley; and some projecting or insulated portions beyond these limits, are occupied by the uppermost formations of the lowest division of oolites. At Collyweston and Easton, near the Welland, the slaty beds of the forest-marble are quarried for roofing-slates. They imbibe more water and retain it longer than the Westmoreland slates. but neither imbibe so much nor retain it so long as tiles do On the slope of the hills on the right bank of the Nene, at Raunds and Stanwick, near Higham Ferrers, beds resembling forest-marble are worked for ornamental purposes; these beds yield a shelly stone of a blue colour, sufficiently compact to take a tolerable polish. The principal bed of this division of the oolitic series is the great oolite. Nearly all the rest of the central part of the county is occupied by the lowermost members of the oolitic series, which extend in some places to the western borders. The predominant beds are of red or rather reddish-brown ferruginous sands, intermixed with calcareous sandstone, which is quarried in some places, though it affords but an indifferent and unsightly material for architectural purposes. The western border of the county and one or two valleys penetrating into the interior are occupied by the lias. Limestone is got in great plenty in almost all parts of the county; the principal lime-works are at Duston and Kingsthorpe, near Northampton. Good clay for making bricks and tiles is found in various places.

Hydrography and Communications.—The greater part of the county belongs to the basin of the Nene, which is the principal river in it. A small portion of the north and north-west borders belongs to the basin of the Welland; another small portion on the west side, to the basin of the Severn; and the southern extremity of the county, to the basins of the Ouse and the Thames.

The Nene is formed by the confluence of two principal streams. One of these rises near Arbury Hill, 2 miles south-west of Daventry, and flows eastward to Northampton, where it is joined by the other principal stream, 'the northern water,' from the village of Naseby. At Northampton the Nene becomes navigable and flows north-east through the county by or near Wellingborough, Higham Ferrers, Thrapston, and Oundle; below Oundle it reaches the border of the county, which it separates for some distance from Huntingdonshire. At Peterborough the navigable channel of the

Nene leaves the county altogether, but the Muscal river, or Catswater drain, which is an antient channel or arm of the river, follows the border some miles farther, till it unites with an arm of the Welland from near Croyland. The length of the Nene in this county or on the border is about 60 miles; that of the Catswater drain about 8 miles. Its principal tributaries are the Ise (24 miles long), which passes near Rothwell and Kettering, and joins the Nene near Wellingborough; and the Harper's Brook (15 miles long), and the Willow Brook (15 miles long), which rise in Rockingham Forest, in the north-west part of the county. These tributaries are not navigable.

The Welland rises at Sibbertoft in this county, 4 or 5 miles south-west of Market Harborough, and flows to the border of the county, which it separates successively from Leicestershire, Rutlandshire, and Lincolnshire. It passes near Rockingham in Northamptonshire, Market Harborough in Leicestershire, and Stamford and Deeping in Lincolnshire. Between Deeping and Croyland it quits the county. Just beyond the border of Northamptonshire there is a channel from the Welland which unites with the Catswater drain. That part of the course of the Welland which belongs to Northamptonshire may be estimated at 48 or 50 miles. The navigation commences at Stamford, from which town there is a navigable cut to Deeping. The Welland has no Northamptonshire tributaries of any moment; its principal feeders are from the other counties, which have been mentioned.

The streams belonging to the basin of the Severn are the Avon, which rises near Naseby, and has the upper part of its course in this county; and the Leam, which has a few miles of the upper part of its course on the border. The streams belonging to the basin of the Ouse are, the Ouse itself, which rises in the county near Brackley, and has part of its course on the border; and the Tow, which rises in the neighbourhood of Sulgrave, near the border of the county, west of Towcester. The streams belonging to the basin of the Thames are the Cherwell or Charwell, which rises at Charwellton, 5 miles south-west of Daventry, and some of its tributaries. All these streams are small in that part of their course which belongs to Northamptonshire.

The Carlisle and Manchester and the Halifax mail-coach road enters the county a few miles beyond Newport Pagnel, Bucks, and passes through Northampton to Market Harborough in Leicestershire. The Leeds mail-road enters the county near Souldrop in Bedfordshire, about 10 miles beyond Bedford, and passes through Higham Ferrers, Kettering, and Rockingham.

The Carlisle and Wetherby and the Edinburgh and York mail-road crosses the northern part of the county between Stilton in Huntingdonshire, and Stamford in Lincolnshire; and the Hull and Lincoln and the Louth and Boston mail-road, which branches off from that just mentioned at Norman Cross in Huntingdonshire, passes through Peterborough to Deeping.

The Grand Junction Canal enters the county near Stoney Stratford, and runs north-west, passing between Northampton and Daventry, until it joins the Oxford canal, two or three small detached portions of which are within this county. One of the summit-levels of the Grand Junction Canal is at Braunston, just within the western boundary of this county; and there are two tunnels, one at Braunston, 2045 yards long, and the other at Blisworth, between Towcester and Northampton, 3080 yards long. There is a navigable cut from near Stoney Stratford to Buckingham, the greater part of which is within this county; there is also a double railroad to Northampton.

The Grand Union Canal unites with the Grand Junction Canal at Long Buckby, not far from the Braunston tunnel; and with the Leicester Union Canal at Foxton, near Market Harborough. There is one tunnel in that part of the canal which is in this county: it is at Crick between Northampton and Lutterworth.

The London and Birmingham Railway crosses this county, following the line of the Grand Junction and Grand Union canals. The Woolverton station is just on the border of the county; and the Blisworth, Weedon, and Crick stations are within it. At Crick the railroad leaves the line of the Grand Union Canal and turns off to the left to Rugby in Warwickshire. A branch railroad from the London and Birmingham, by Northampton and Market Harborough to Leicester, has been proposed; and the projected Great Northern Railway (for part of which line, viz. from London to Cambridge, an act has been obtained) was designed to pass through the north-eastern extremity of the county from Peterborough to Deeping.

Agriculture.—The county of Northampton has many advantages in point of climate and soil, and has for a long time been comparatively well cultivated and productive. The soil is generally adapted to produce both corn and pasture of a superior quality. A small proportion only of the surface is poor from the thin staple of the soil or from a cold impervious subsoil; leaving out the natural woods, which are considerable, that which remains unproductive for want of cultivation is trifling, and could easily be improved. The climate is mild and healthy. The subsoil, being mostly rocky, allows all superfluous water to run down through it; and where a stratum of clay intervenes, the inequality of the surface allows a ready discharge of the water. The surface of the county, except a portion of low flat land north of Peterborough, may be, on an average, about 300 feet above the level of the sea; the greatest height does not exceed 500 feet, if we except the summits of some hills about Daventry, which may rise to the height of 800 feet above the sea.

The following elevations are from actual survey:—

	Elevation in feet.
River Ouse near Stoney Stratford . .	200
River Nen above Northampton . .	195
Grand Junction Canal at Blisworth and Weedon	315
Grand Junction Canal at Braunston tunnel	375
Buckley road, half a mile from Daventry .	430
The summit of the hills around Daventry, supposed the highest points in the county . .	800

Owing to its inland situation and the absence of lofty hills, this county is not so subject to heavy and continued rains as those which lie farther west. The surface is pleasingly diversified by gentle swells and depressions interspersed with woods and plantations.

The richest soil in the county is perhaps the black mould of the fens, when they have been drained and cultivated; but the most desirable for the farmer is the brown crumbling loam of the uplands. Where this is of a sufficient depth, it will produce, with little trouble, abundant crops of wheat, beans, barley, and oats, and it is peculiarly adapted to turnips and all green crops. On such land the farmer will certainly thrive, if he does not neglect his business. The pastures are both rich and sound, and the cattle grazed in them in summer repay the capital laid out on them with good interest; while those which are kept on turnips in the yard, to be turned out in summer, or are stall-fed to bring them to a marketable state, convert the straw, which is everywhere abundant, into rich manure. These remarks indeed are only applicable to a very good soil, but they apply particularly to that hazel loam which is neither light nor heavy, which does not bake hard in drying, and although consisting chiefly of minute particles of clay, lime, and sand, does not retain too much water.

There is a considerable portion of limestone rock in the county, but there is no appearance of chalk. The calcareous portion of the soil, which, in some rich land hastily analyzed, was found to be from 10 to 15 per cent., is in a very divided state, and must greatly influence the fertility. The heavier kinds of soil, which are more retentive of water, are found to produce excellent pasture, and are accordingly left in grass, as the most profitable for the farmer, if he is well skilled in selecting cattle to graze, and has a sufficient capital. For although more food might be produced from the land by tillage, and more hands usefully employed and fed, it is very doubtful whether the farmer would be so well remunerated for his risk, trouble, and outlay, as he is by grazing cattle. As long as the price of meat is high in comparison with that of grain, which has been the case for many years past, the grazing of the rich lands of Northamptonshire, Leicestershire, and Lincolnshire will always produce the greatest rent and profit.

The implements in use in this county have been much improved of late years. The old clumsy plough, with or without wheels, which was the only one known a century ago in the midland counties, is now replaced by a neater instrument, the principal parts of which are of iron. The Rutland plough with two unequal wheels attached to the beam, one to run in the furrow last made, and the other on the unploughed surface, is in general use. It is a plough

easily held, and from some experiments lately made with great care by Mr. Handley, M.P. for Lincolnshire, it appears to be of less draught than the common swing-plough without wheels. Three horses and a driver are used even in very friable soils, and a Norfolk team of two horses abreast driven by reins in the plough is a rarity in the county.

The harrows, scarifiers, rollers, carts, and waggons have nothing peculiar in them. There are some threshing-machines on large farms, but the flail is still the principal instrument in use.

The old course of husbandry was the triennial; a clean fallow, wheat, beans, and oats on the best heavy soils, and wheat, peas, and barley on the lighter. The introduction of turnips and clover has changed the system, and greatly improved the produce. But where turnips are not suited to the soil, from its compact nature, the clean fallow, at least every fourth year, is still retained. On some lands barley or oats are sown after wheat. In the improved rotations the land is frequently left three years in grass, and then ploughed up again, which brings it to the convertible system generally adopted in the north. The most common error is that of cropping the land too often after it is broken up from grass, and reducing it to too low a state before it is recruited with manure or improved by pasturage. This error is not so injurious on very rich soils, but when the soil is of inferior quality it destroys all the advantage gained by several years' lying in grass. There is a great difference between natural inherent fertility, such as that of rich loams and alluvial deposits, and that which is produced by manuring and pasturage. The first will bear much ill usage, but the latter will not.

The permanent pastures are very good in most parts of Northamptonshire, and few landlords would permit a tenant to plough up any part of them. The extent of meadow-land of this description is reckoned in the Agricultural Report at 40,000 acres; if to this be added all that has been laid down since and the artificial grasses raised on arable land, we shall find that 80,000 acres at least are devoted to feed cattle, without reckoning the clover and other artificial grasses mown for hay.

In all old pastures, ant-hills are a great nuisance: when greatly multiplied the grass on them is of no value and they take up much ground. The best mode of getting rid of them is to open them when frosty weather sets in, by cutting them in the form of a cross by a sharp-edged spade, the four angular pieces thus cut are separated from the ant-hill by the spade and turned back on the adjoining grass. The earth, with all the ants and their eggs, is then dug out and spread over the ground, the grass pared off is replaced, and if this be done in rainy weather before a frost, no ants will appear in the spot thus treated, and the whole pasture may in this manner be restored to a level and equal turf.

The fattening of cattle is a principal object of the Northamptonshire farmer. Some breed their own bullocks, but this is only when they have some improved breed of their own. Earl Spencer, the Marquis of Exeter, and many others are great breeders, and find breeding as profitable as fattening; but the majority of farmers, who have not the same advantage, prefer buying cattle reared on less valuable land, justly thinking that an animal reared on poor land and in a severer climate will thrive better and improve faster than one bred in a mild climate and a rich pasture. Hence they buy Scotch and Welsh cattle in autumn, turn them into the pastures to eat the coarse grass remaining after the fat beasts are sent to market during the winter, and finish them on grass next summer. These animals improve greatly, and if they do not come to a large size, they give at least a very good profit. Some few farmers feed the Scotch cattle during the winter on turnips; but generally those who can spare turnips for this purpose buy a larger sort of cattle in the autumn. Many Hereford long-horns and Durham short-horns are bought in spring, carried on at grass till near winter, and then finished with turnips, oil-cake, and chopped straw. They make much and rich manure; and if they pay for the food which they have consumed, the farmer is satisfied. Any profit in addition to the manure is so much clear gain. The short-horn breed has of late become a favourite stock, and has almost superseded the once famous long-horns, chiefly from the example of Earl Spencer and the Marquis of Exeter, whose breeds of short-horns cannot be surpassed. At the Oxford agricultural meeting in 1839 Lord Spencer accepted a challenge which was offered by a well known Sussex breeder, who proposed to show 100 head of Suffolk beasts against the same number of any breed. The judges, having inspected both stocks, had no hesitation in giving their award in favour of Lord Spencer's short-horns, although one of the judges was from Sussex. In fact the improved short-horn breed unites as many good qualities as can well be found in any other breed; the Hereford disputes the prize of aptitude to fatten, but the Hereford cow gives so small a quantity of milk, that all the farmers in Northamptonshire who breed cattle prefer the short-horned breed. It is yet very doubtful whether the small Scotch Highland cattle do not pay fully as well for their pasture and stall-feeding as either the Hereford long-horns or short-horns, at least on land of an average quality.

The breed of sheep most common in the rich pastures of Northamptonshire is the improved Leicester: and since long wool has been in request, and sells dearer, in proportion to the weight of the fleeces, than the finest short wool, scarcely any other breeds are in repute. The South-downs, on account of the flavour of their flesh, may dispute the pre-eminence with the Leicester breed, but no other sheep can enter into competition with the latter. Some very fine flocks of breeding ewes are kept in the county, and rams are bought, or hired for the season at very high prices, from those whose chief business is to rear the best.

There are many considerable estates in Northamptonshire, but the farms are in general not very large. They are usually let from year to year, with the understanding that the tenant shall not be removed as long as he pays a fair rent and cultivates the land properly. This is very well on estates which are in settlement, but where they are liable to be sold, the tenant has no great security, and will not lay out much capital in useful improvements, of which he may not reap the benefit.

More leases have been granted of late years, and a more improved state of cultivation has been the consequence. The farm-buildings were described by Mr. Donaldson and Mr. Pitt, in their Surveys, as by no means worthy of the fruitfulness of the soil, being inconvenient both as to architecture and situation. In this respect there is now a manifest improvement. Many excellent farm-buildings and houses have been erected; and the respectability of the tenants has increased in proportion. The very large barns formerly thought indispensable to house the crop in are now much reduced. The corn is stacked in the open air, and better preserved by a covering of thatch. Frames of wood on stone or iron pillars receive the corn, which is laid with the ears inward, and forms a round or square stack ending in a cone or pyramid, which is covered with straw and well thatched. It is thus safe from vermin, and the air circulating around and through it, the grain when thrashed comes out hard and dry.

Gardens and orchards are not a remarkable feature in this county. Little or no cyder is made, barley supplying the favourite beverage. The woods are extensive, and many plantations have been made in the neighbourhood of the numerous residences of the nobility and gentry. The most considerable forest is that of Rockingham, part of which has been converted into farms from time to time. These woods have been much neglected till lately, and might have been made far more productive than they have been. The pasturage of deer and cattle, and the customary rights which existed from time immemorial, have prevented the increase of timber. The navigation of the Grand Junction Canal, which brings coals to different parts of the county, has much lowered the price of underwood for fuel; and the fall in the price of oak timber since the peace has likewise diminished the value of woods.

The following are the principal fairs held in Northamptonshire:—Broughton Green, June 24, 25, 26, general fair; Brockley, Wednesday after February 25, April 24, Wednesday after June 22, December 11, horses, cows, sheep; Brigstock, April 25, September 4, cattle; Brixworth, Whit Monday; Daventry, Easter Tuesday, June 7, August 3, October 2 and 27; Fotheringay, third Monday after July 6; Higham Ferrers, March 7, June 28, Thursday before August 5, October 11, December 6; Kettering, Thursday before Easter, Friday before Whit Sunday, Thursday before October 11, Thursday before December 21; Northampton, February 20, April 5, May 4, June 19, August 5, 26, [illegible] vember 28, December 19, cattle; Oundle, Febr[illegible] the Whit Monday, August 21, October 12; Peterborough, [illegible] 10, October 2, horses; Rockingham, September 25, cattle, horses; Rothwell, Trinity Monday, lasts a week; Towces-

ter, May 12, October 29, cattle; Wellingborough, Easter Wednesday, Whit Wednesday, cattle, October 29, cattle and cheese; Yardley, Whit Tuesday, horned cattle.

Divisions, Towns, &c.—The county of Northampton, at the time of the Domesday survey, contained thirty hundreds; but the number has been reduced. There are now only twenty hundreds, the names of which, with their situation in the county, their respective areas, and their population in 1831, are as follows —

Hundred.	Situation.	Acres.	Pop. 1831.
Chipping Warden . .	W.	21,370	4,697
Cleley	S.E.	26,620	7,413
Corby . . .	N.W.	59,400	10,434
Fawsley . . .	W.	49,190	14,157
Greens Norton . .	S.E.	22,080	5,333
Guilsborough . .	W.	43,260	9,719
Hamfordshoe . .	Central	16,530	8,178
Higham Ferrers . .	E.	30,430	8,236
Huxloe . . .	Central	41,790	12,837
King Sutton . .	S.	48,250	12,435
Nasaburgh (or Peterboro' Liberty) . . .	N	52,860	15,624
Navisford . . .	E.	13,090	2,735
Nobottle Grove . .	Central	34,160	8,726
Orlingbury . . .	Central	29,600	5,694
Polebrook . . .	E.	19,840	4,537
Rothwell . . .	N.W.	42,640	7,860
Spolhoe . . .	Central	19,170	21,201
Towcester . . .	Central	12,980	4,873
Willy Brook . . .	N.	27,490	5,790
Wymersley . .	E	36,060	8,857
		646,810	179,336

There are in the county, the county and market town and borough of Northampton; the city of Peterborough; the borough and market towns of Brackley and Higham Ferrers; and the market towns of Daventry, Kettering, Oundle, Thrapston, Towcester, and Wellingborough. Kingscliffe, Rockingham, Rothwell, and Weldon formerly had markets. Brackley (pop. 2107) and Peterborough (pop. 5553) are described elsewhere. [BRACKLEY; PETERBOROUGH.]

The county-town, Northampton, is locally in the hundred of Spolhoe, on the north bank of the Nene, 67 miles from London. Its origin is unknown. In the peace between Alfred and the Danes it is likely that Northampton was included in the Danish territory, and was one of the burghs, or a dependency of one of the burghs, which they formed in Mercia. In A.D. 918 or 919, and again in 921, the Danes of Northampton (or simply Hampton, Hamtonia, as Henry of Huntingdon calls it, though Florence of Worcester calls it Northamtun) with their earls Thurferth and Thurkytel, submitted to Edward the Elder. In the reign of Ethelred II. Northampton was nearly ruined by the Danes (A.D. 1010), and about the close of the reign of Edward the Confessor it suffered from the Northumbrian army under Morcar, or from the king's troops under Harold, which in consequence of civil dissensions met here. After the conquest, Simon de St. Liz, on whom the Conqueror conferred the earldom of Northampton, built a castle here: and in the following reigns several ecclesiastical councils and parliaments were held in this town. In the reigns of Richard I., John, and Henry III., there was a mint at Northampton. In the reign of Henry II. (about A.D. 1174), the townsmen, who sided with the king against his children, were, with the royal troops, defeated by Anketil Mallore, a supporter of the young princes. In the civil wars of John, Northampton castle was held for the king, and besieged in vain by the barons (A.D. 1215). Toward the close of the king's reign the castle was given to Fulke de Brent, and in a conflict between his soldiers and the townsmen a considerable part of the town was burnt. In the troubles of the close of the reign of Henry III., Northampton, held by the barons, was taken by the king (A.D. 1264). In 1265 Northampton was taken by the barons, but recovered by the king's party. In the commencement of the war of the Roses, a great battle was fought near the town (10th July, 1460), in which the Lancasters were defeated by the earl of March (afterwards Edward IV.) and the earl of Warwick. The king, Henry VI., was taken; and the queen and the young prince escaped with difficulty. In the civil war of Charles I. Northampton was taken by Lord Brooke and fortified for the parliament. In 1675 the town was nearly consumed by a fire.

The borough boundaries enclose an area of 1520 acres divided among the four parishes of All Saints (pop. 7333), St. Giles (pop. 3025), St. Peter (706), and St. Sepulchre (4287). The borough limits extend beyond the town, and include a considerable quantity of agricultural land on the north and east. The town is pleasantly situated on a slope rising from the north bank of the Nene, over the two branches of which, within the limits of the borough, are three bridges. It consists of several streets irregularly laid out: the two principal lines of street, of which one is along the Carlisle and Manchester mail-road, intersect at right angles. One of the bridges over the Nene, a handsome stone bridge of three arches, is at the south end of that street which runs along the Carlisle road, and at the entrance of the town from London. One of the other bridges is over the Northern water, at the western end of the other principal line of street. The houses are well built, chiefly of stone; and the streets are paved, and lighted with gas. The market-place is a large open area in the centre of the town. Among the principal edifices are the shire-hall, a spacious building of elegant Grecian architecture; the county gaol; the town-hall, an antient building; the borough gaol; the theatre, a building erected early in the present century; the barracks; and the infirmary, a handsome building on the east side of the town, erected and fitted up in 1793. All Saints church is in the centre of the town, at the intersection of the principal streets; it was erected after the great fire of 1675: it is a plain building of incongruous architecture, having in the centre a cupola supported on four Ionic columns. At the west end is the original embattled tower, which escaped the fire. St. Giles's Church, near the east end of the town, is a large cross church with portions of various styles. The western doorway is Norman; part of the chancel is early English, of very good composition; the east window is of decorated English; and several of the other windows are of perpendicular character. St. Peter's, near the West bridge, is a remarkably fine and curious specimen of enriched Norman. It consists of a nave with side aisles, separated from it by piers and arches; with a square western tower. The capitals of the piers in the nave are elaborately carved, and the arches have zigzag indentations running round them. [NORMAN ARCHITECTURE.] Three of the piers have diamond shaped or spiral mouldings. The tower has some curious Norman ornaments on the outside, and opens into the nave by an arch richly ornamented with zigzag mouldings. This tower has some singular buttresses, apparently added when the belfry story, which is of later date, was built. There is a small arched crypt continued east of the present chancel, which has been probably shortened. St. Sepulchre's is on the north side of the town: it was built probably about the beginning of the twelfth century, and is one of the few round churches: it has eight circular piers with Norman capitals, and plain pointed arches: there is a chancel with a north and south aisle on the east side of the round part, and a good tower and spire of perpendicular character on the west side. There are several dissenting meeting-houses; among them is the Castle Hill meeting, which contains a mural tablet to the memory of Dr. Doddridge, who exercised his ministry and conducted an academy for the education of ministers in this town for more than twenty years. Northampton had once seven churches: two have quite disappeared; a part of the third, St. Gregory's, near St. Peter's, is used as a school-house. Of the several religious houses which existed before the Reformation, the hospitals of St. Thomas and St. John yet remain. That of St. John, for infirm poor persons, consists of a chapel and a large hall, with apartments for the inmates; that of St. Thomas is for twenty poor alms-women: both these buildings have portions of early English, decorated English, and perpendicular character. Of the castle, which was near the West bridge, there are only the earth-works; and of the town walls there are no traces.

The principal branch of trade carried on in the town is boot and shoe making, in which upwards of 1300 men are employed. The articles are sent to London and other parts of England, or are exported. Considerable business is done in currying leather; some stockings and lace are made, but the lace-making has much declined since the introduction of machinery. There are three iron-foundries. The trade of the town is facilitated by the navigation of the Nene,

and by the double railroad communicating with the Grand Junction Canal. The principal market-day is Saturday; it is a large cattle-market; there are two subordinate markets in the week; there are eight yearly fairs, three of them large horse-fairs, three others for live-stock, another for general merchandise, and another for sheep and cheese.

The assizes for the county are held here, also the quarter-sessions for the division, and the court of election for members of parliament for the southern division of the county. There are races in spring and autumn, held on a course to the north of the town. Northampton is a borough by prescription; it is mentioned as a borough in Domesday Book. The governing charter is of 36 Geo. III. By the Municipal Reform Act the borough has been divided into three wards, and has six aldermen and eighteen councillors. The revenue of the corporation arising from lands, tolls, &c. is nearly 1500*l.* per annum. There are quarter-sessions for the borough held regularly; and a Court of Record for civil suits, little used; the expenses of the police and the administration of justice are defrayed by a town-rate. There are numerous charities.

The livings of All Saints, St. Giles, and St. Sepulchre are vicarages, of the clear yearly value of 350*l.*, 111*l.* (with a glebe-house), and 149*l.* (with a glebe-house), respectively; that of St. Peter is a rectory united with the perpetual curacies of Kingsthorpe and Upton, of the clear yearly value of 860*l.*, with a glebe-house.

There were in the borough, in 1833, two infant-schools, with 232 children; six dame-schools, with 108 children; four endowed schools, with about 170 children; a central national day and Sunday school for the county, with 372 children in the week and 987 on Sunday; a Lancasterian school, with 508 children; twenty-seven other day-schools, with 629 children; one day and boarding school, with 29 children; and thirteen Sunday-schools, with 2180 children. Three of the endowed schools are for boys and one for girls; the boys are clothed as well as educated; the girls are entirely supported.

Higham Ferrers is in the hundred of Higham Ferrers, 65 miles from London. The area of the parish is 2260 acres; the population in 1831 was 965, more than a fourth part agricultural. The town stands on a rocky eminence half a mile from the eastern bank of the Nene, and consists chiefly of one long street running north and south. Its elevated site renders it clean and healthy; but the houses are generally poor, and the streets are not lighted. It has a large and curious church, formerly collegiate, having two naves of equal height, with small clerestory windows in each of the outer sides, and a north and south aisle, thus presenting three rows of piers and arches, and four spaces. Some of these piers and part of the tower are of early English character, but most of the church is of later date. Some of the windows are of decorated English character and good design; others are of perpendicular character. The western entrance is much enriched with sculpture; and the church contains an antient font, some good wooden screen and stall work, and some painted glass. The upper part of the tower is of later date and is surmounted with a crocketed octagonal spire. Near the church are a grammar-school (a fine stone building), and a bead-house or alms-house, founded by Archbishop Chicheley, which has some portions of good perpendicular character, but much mutilated. There are also some remains of the antient college, a portion of which has been converted into a dwelling-house. There is a town-hall of modern erection. The principal business of the place is shoe-making; the making of lace, which formerly was much followed, has declined since the introduction of machinery into that manufacture. There are seven yearly cattle-fairs.

The town was incorpated in the reign of Philip and Mary: the borough is not quite co-extensive with the parish. The municipal officers are a mayor, seven aldermen, thirteen capital burgesses, a recorder, &c.; this corporation was left untouched by the Municipal Reform Act. The borough returned one member to parliament from its first incorporation, until the passing of the Reform Act, by which it was disfranchised. The living is a vicarage, united with the chapelry of Chelveston and Caldecott, of the clear yearly value of 245*l.*, with a glebe-house. There is a Wesleyan Methodist chapel. There were, in 1833, six dame-schools, with 37 children; the endowed grammar-school, with 57 children; one other day-school, with 26 children; and two Sunday-schools, with 246 children.

Daventry is in the hundred of Fawsley, 72 miles from London. The area of the parish (including the hamlet of Drayton) is 4090 acres; the population, in 1831, was 3646, a very small portion agricultural. This town probably rose from the decay of the neighbouring British and Roman stations of Bennavenna and Isanavatia. During the civil war of Charles I. the neighbourhood of the town was the scene of some skirmishes. In 1660, General Lambert, who had collected a force at Daventry, to oppose the designs of General Monk for the restoration of the king, was taken prisoner near the town by Colonel Ingoldsby.

The town is on an eminence, and consists of two principal streets and some smaller ones, partially paved and lighted; the houses are generally neat and well built. The church is a modern building, consisting of nave, side aisles, and chancel. There are meeting-houses for the Independents and Wesleyan Methodists. The town has no manufacture, except that of whips. There is a market on Wednesday, and there are nine annual fairs, chiefly for cattle and horses. The Dissenting Academy at Northampton was removed to Daventry on the decease of Dr. Doddridge, A.D. 1752 [DODDRIDGE, PHILIP], and continued there under the charge successively of Dr. Ashworth, Mr. Robins, and Mr. Belsham, till A.D. 1789, when, on Mr. Belsham's resignation [BELSHAM, THOMAS], it was removed to Wymondley. It has since been transferred, under the designation of Coward College, to London.

Daventry is a borough by prescription; the corporation, under the Municipal Reform Act, consists of four aldermen and twelve councillors. By that Act, the town was not to have a commission of the peace, except on petition and grant. There were, before the Act, sessions held once a year. There is a small gaol, built within these few years. The corporation revenues are very trifling.

The living of Daventry is a perpetual curacy, of the clear yearly value of 344*l.*, with a glebe-house.

There were, in 1833, two day-schools, partially endowed, with 12 children; seventeen other day-schools, with 376 children; a national day and Sunday school, with 152 children, partly supported by an endowment and by subscription (some of the children are clothed); and four Sunday-schools, with 511 children.

Kettering is in Huxloe hundred, 74 miles from London. The area of the parish is 2840 acres; the population in 1831 was 4099, about one-eighth agricultural. The town is on the slope of a hill, at the foot of which runs a small brook, a feeder of the Ise. The market-place is spacious, and is surrounded by well-built houses and respectable shops. The church is a large and handsome building of perpendicular character, consisting of a nave, side aisles, and chancel, with a very fine tower and rich hexagonal crocketed spire at the west end. The west door and a four-light window over it are rich examples of the perpendicular style.

There are several dissenting places of worship. Wool stapling and wool-combing are extensively carried on in the town; there is a considerable manufacture of shoes; and that of silk shag for hats has been lately introduced; about 200 men were, in 1831, employed in these last two branches of industry. The market is on Friday, and there are three yearly fairs for live-stock and pedlery. The living is a rectory, of the clear yearly value of 786*l.*, with a glebe-house.

There were, in 1833, a free grammar-school, with a good endowment, containing 37 boys; another endowed school, with 22 girls; nine other day-schools, with 194 children; one boarding and day school, with 22 girls; two national day and Sunday schools, with 195 children in the week and 298 children on Sundays; and four Sunday schools, with 525 children. Besides these there are several schools for teaching lace-making.

Oundle is in Polebrook hundred, 81 miles from London. The area of the parish, including the hamlets of Ashton, Biggin, Churchfield, and Elmington, is 5300 acres; the population, in 1831, was 2450, nearly one-third agricultural. The town is on a slope on the left bank of the Nene, which here makes a considerable bend, nearly surrounding the town, and is crossed by two bridges on opposite sides of the town: that on the north-east side, distinguished as 'the North bridge,' over which the road to Peterborough passes, is a fine bridge of several arches; connected with it is a causeway, raised on arches, to secure a passage over the flats near the river when the waters are out. The streets are

well paved and lighted, and the houses generally modern and well built. There are a commodious market-house and shambles. The church, which is large and handsome, consists of a nave with side aisles, chancel, large transepts, and a tower and spire 209 feet high. Most of the piers and arches and some of the windows are of early English character; the clerestory and several of the windows are of decorated English; the tower and spire, the south porch, part of the transepts, and several of the windows are of perpendicular character. Each part is excellent in its style. The tower has four pinnacles at the angles, and the spire is hexagonal and crocketed: they are peculiarly fine. The church contains some rich stalls, some good wood screen-work, and a few remains of antient stained glass. There are an almshouse and a grammar-school near the church. The market is on Thursday, and there are three yearly fairs for live-stock. Petty-sessions for the division are held every fortnight. The living is a vicarage, of the clear yearly value of 376*l.*, with a glebe-house.

There were, in 1833, an endowed free grammar-school, with 66 boys (28 on the foundation); an endowed charity-school for 30 boys, who are educated and clothed; another endowed school, with 12 boys; an endowed day and Sunday school in Ashton hamlet, with 14 children; two other day-schools, with about 30 children; two boarding-schools, with 85 children; a national day and Sunday school, with 123 children in the week and 175 on Sundays; and several Sunday-schools.

Thrapston is in Navisford hundred, 73 miles from London. The area of the parish is 990 acres: the population, in 1831, was 1014, above one-fourth agricultural. Thrapston is pleasantly situated on the right bank of the Nene, over which river there is a handsome wooden bridge of several arches. The houses are in general neat and well built, and there are several genteel residences in the vicinity. The church consists of nave, side aisles, chancel, and transepts, with a tower and spire at the west end. Most of the piers and arches, with a fine south door, are of early English character; the chancel and some other portions are of decorated English, and the tower and spire of perpendicular. In the chancel are three stone stalls, with rich mouldings and crocketed canopies. There are corn-mills and a paper-mill on the river and sand-pits and stone-quarries in the neighbourhood: some whips and lace are made. The market is on Tuesday, for corn and live-stock; it is the largest market in the county for swine: there are two yearly fairs for live-stock, pedlery, and shoes, and for hiring servants.

The living is a rectory, of the clear yearly value of 348*l.*, with a glebe-house. There were, in 1833, two boarding and day schools, with 103 children; the larger of the two was partly supported by an endowment; there were also three day-schools, with 56 children, and two Sunday-schools, with 207 children. There is a Baptist meeting-house.

Towcester, in the hundred of Towcester, is 60 miles from London. The area of the parish (which comprehends the hamlets of Caldicott, Handley, and Wood-Burcot) is 2790 acres: the population, in 1831, was 2671, one-third agricultural. Some antiquaries place here the station Lactodorum of the Antonine Itinerary; at any rate the termination 'cester' indicates that it was a Roman town. Numerous coins found here, especially on an artificial mound called Berrymont Hill, north-east of the town, confirm this conclusion. Traces of the Saxon works erected by Edward the Elder (A.D. 921) to defend the town from the Danes are yet discernible. Towcester is situated on the right bank of the Tow, and consists principally of one long street on the road from London to Coventry and Birmingham: this street is paved, and is lined with well built houses. The church is a neat building in the early English style; there are three dissenting places of worship, and three almshouses. The chief trade of the place is in boots and shoes, and in lace, all of which are made here: the town also derived considerable advantage from its situation on a great public thoroughfare, but it has probably suffered by the diversion of traffic consequent on the opening of the Birmingham railway. The market is on Tuesday, and there are two yearly fairs for live-stock and general merchandise. The living is a vicarage, of the clear yearly value of 217*l.*, with a glebe-house. There were, in 1833, four dame-schools, with 30 children; a day-school, with 56 boys, partly or wholly supported by an endowment; four other day-schools, with 137 children; and four Sunday-schools, with 490 children

Wellingborough is in the hundred of Hamfordshoe, 67 miles from London. The area of the parish is 4490 acres; the population, in 1831, was 4688, about one eighth agricultural. The town is on an eminence just above a little brook which flows into the Nene; and from half a mile to a mile from the left bank of the Nene itself. The town was rebuilt in 1738, after a dreadful fire. It now consists of a number of streets, irregularly laid out, the principal of which meet in the market-place: they are lighted, and, from the situation of the place on a slope, are generally clean. The houses are for the most part built of a red sand stone, on which rock the town stands. The church is large and handsome, and of various styles of architecture. A south door is Norman; the tower and spire at the west end are of early English, a fine specimen of the later period of that style, approaching in some parts to the decorated English. Some of the piers and arches of the nave, and the east window, a remarkably fine composition of five lights, with admirable tracery and mouldings, are of decorated English character; the rest of the church is perpendicular, of fine composition and execution. There are some antient screen-work and wood stall-work, and a modern font, a good imitation of antient work. There are several dissenting meeting-houses in the town. The principal manufacture of the place is that of boots and shoes. Many of the females are employed in making lace, though that branch of industry has much declined. A silk-mill has been established within a few years. The market is on Wednesday, and is a very considerable market for corn: there are two yearly fairs for live-stock, and a third for live-stock and cheese. Petty-sessions for the division are held every week in the town-hall. The living is a vicarage, of the clear yearly value of 400*l.*

There were, in 1833, sixteen infant or dame schools, with 187 children; an endowed grammar-school, with 44 boys; a 'lower school,' supported from the same endowment, with 100 boys; another free-school, with 60 children; two Lancasterian schools, taught by the same mistress, each held three times a week, for two hours and a half, and each attended by 32 girls; two other day-schools, with 48 children; and five Sunday-schools, with 797 children.

Wellingborough got its name from the wells or springs about the town. One of these, 'the red well,' a chalybeate, was formerly in high repute. Charles I. and his queen resided here, in 1626, under tents, in order to have the benefit of it.

Kingscliffe is in Willybrooke hundred, between Rockingham and Peterborough. The area of the parish is 4460 acres: the population, in 1831, was 1173. It is supposed to have received its designation from king John having had a hunting-seat here. The church is dedicated to All Saints; there are some almshouses. The market, formerly on Tuesdays, has fallen into disuse, but there is a yearly fair for cheese, linen, and turnery ware. The living is a rectory, of the clear yearly value of 525*l.*, with a glebe-house.

There were, in 1833, five day-schools (two of them endowed, another a national-school, and another partly supported by charitable contributions), with 137 children; one boarding and day school, with 31 children; and three Sunday-schools, with 87 children.

Rockingham is in the hundred of Corby, 83 miles from London. The area of the parish is 890 acres; the population, in 1831, was 296, chiefly agricultural. This place consists of one street, on the declivity of a hill running along the road, and is in the midst of Rockingham forest, antiently one of the largest forests in the kingdom. The town is said to have derived its origin from a castle built on the top of the hill by William I. for the defence of the extensive iron-works then carried on in the forest. Some of the earlier kings occasionally resided here. Many of the works were standing in Leland's time. It was fortified for the king in the civil war of Charles I., and besieged by Cromwell; at present the only remain is a grand entrance gateway, flanked on each side by a tower. Part of the church was destroyed during the siege of the castle by Cromwell; the remainder contains several sumptuous monuments. The market has been discontinued: there is a yearly fair for live-stock, clothes, and general merchandise. The living is a rectory, of the clear yearly value of 81*l.* There was, in 1833, one day-school, supported by Lord Sondes, with 40 children.

Rothwell, popularly Rowell, is in the hundred of Rothwell, 78 miles from London. The area of the parish is

4430 acres, with a population, in 1831, of 2002, including the chapelry of Orton and the hamlet of Thorpe Underwood; or excluding these, 3130 acres and 1875 inhabitants. The town is situated on the southern slope of a hill: the ruin of the market-house, begun by Sir Thomas Tresham, A.D. 1577, but never finished, is a remarkable object; it consists of a square area surrounded by large pointed arches, designed for the market, and a suite of rooms with wide square-headed windows over; the whole is ornamented with Doric pilasters, shields with arms, &c. The church has an embattled tower and a fine doorway of early English character. There is a large yearly fair for live-stock, pedlery, and leather. A few persons are engaged in weaving plush.

The living is a vicarage, united with the chapelry of Orton, of the clear yearly value of 145*l*.

There were, in 1833, three infant or dame schools, with 76 children; seven day-schools (one endowed, another a national-school, and two others supported by charity), with 238 children; and three Sunday-schools, with 431 children.

Weldon, distinguished as Great Weldon, is in Corby hundred, between Rockingham and Oundle. The parish has an area of 2350 acres, with a population, in 1831, of 338, half agricultural. Including the hamlet of Little Weldon, the area is 3680 acres, the population 778. The houses are chiefly built of stone. There are four fairs in the year for general merchandise. The living is a rectory, of the clear yearly value of 209*l*., with a glebe-house. There were, in 1833, two dame-schools, with 36 children; one day-school, with 30 children; and a national-school, with 70 children in the week and 96 on Sundays.

Braunston is a populous village in Fawsley hundred, near the union of the Grand Junction and Oxford canals, and about 3 miles north-west of Daventry. The church is large and handsome, with an octagonal crocketed spire 150 feet high. There is also near the upper end of the village a stone cross, surmounted with an entablature decorated with four busts, supposed to represent the four evangelists. Braunston had, in 1831, 1380 inhabitants.

Weedon-beck is also in Fawsley hundred, 4 miles south-east of Daventry. Its distinctive epithet 'Bec' was derived from the circumstance of a religious house being established here as a cell to the abbey of Bec in Normandie. It is sometimes also called Weedon-in-the-Street, from its situation on the Watling Street. Wulfhere, king of Mercia, had a palace here. The church is an antient building, and contains portions in the Norman and the various styles of English architecture. There are one or two dissenting places of worship. The royal military depôt at Weedon contains extensive barracks; spacious storehouses for artillery, small-arms, and ammunition; an hospital, and workshops for artisans: it is one of the finest establishments of the kind in Europe. The population of Weedon-beck, in 1831, was 1439.

Earl's Barton is in Hamfordshoe hundred, 4 miles south-west of Wellingborough: it had, in 1831, 977 inhabitants. The church is very antient, and has several peculiarities of structure. The tower is probably of Anglo-Saxon architecture, and very rude. It is divided into four stories, each of which is constructed with large but thin upright stones, disposed like the frame or wood-work of old timber-houses, and having the intervals between every two filled up with small stones, mortar, and rubble. There are a small west doorway in the lower story, and one or two small windows, unglazed, in the stories over it; and in the fourth story two large openings of several lights; the lights have semicircular heads, and are divided by stone partitions of the shape and appearance of balusters. The summit of the tower, which is embattled, is of late date. (Britton's *Architectural Antiquities*.) The southern doorway is of highly-enriched Norman workmanship.

Raunds is in the hundred of Higham Ferrers, 4 miles north-east of Higham Ferrers: it had, in 1831, a population of 1870. The church is large and handsome, with a remarkably fine and lofty tower and spire. The steeple is early English, and is one of the best specimens of that style in the county. The church has some early English piers and arches, some decorated windows, and some of perpendicular character.

Rushden, in the same hundred, is one mile and a half south of Higham Ferrers: it had, in 1831, a population of 1248. It has a cross-church, large and handsome, with a fine tower and spire of perpendicular character: the piers and arches, the transepts, and part of the chancel, are of decorated English character. The north door is of early English date, and has over it a rich porch of perpendicular character. There are in the church some early English stalls, and some remains of screen-work and of stained glass. There is an octagonal font, of early English, on a pedestal of later date. A few persons are engaged in manufactures.

Wollaston is in the same hundred, 3 miles south-east of Wellingborough. It has a handsome cross-church, with a lofty tower and spire at the intersection.

Irthlingborough is in Huxloe hundred, two miles north-west from Higham Ferrers: it had, in 1831, a population of 1262. A considerable number of the working men are employed in shoe-making. The church, which is antient, had formerly a college, consisting of a dean, five secular canons, and four clerks. The ruins of the college buildings yet remain between the tower and the body of the church. The tower is square, of early English character and good composition, with an octagonal lantern on it of later erection. The church consists of a nave, with two aisles, a transept, and a lofty and spacious chancel: there are in the church some antient tombs and stalls. In the centre of the village is a stone cross, consisting of a shaft thirteen feet high, raised upon steps. There are two dissenting places of worship.

Kingsthorpe is in Spolhoe hundred, 2 miles north of Northampton: it had, in 1831, a population of 1344. There is a town-hall in the village for the meeting of the trustees of the manor, which is a royal demesne, held in trust for the benefit of the townsmen; there are also a dissenting meeting-house, and some trifling remains of a former hospital or almshouse, incorporated in the walls of cottages of later erection. There are considerable stone-quarries, extensive lime-works, and a brick-kiln in the parish, in which a considerable number of labourers are employed. The church is spacious, partly of Norman character, partly in the later styles: it consists of a nave, north and south aisles with chapels, and a lofty western tower and spire.

Moulton, a village a mile in length, 4½ miles north-east of Northampton, had, with the extra-parochial liberty of Moulton Park, 1334 inhabitants in 1831. In its church, which consists of a nave, side-aisles with chapels, chancel, south porch, and western tower, there are some piers and arches of Norman architecture. There are two dissenting places of worship.

Hardingstone is 2 miles south-east of Northampton, in Wymersley hundred. It had a population, in 1831, of 1036. The church has some portions of early English architecture, and there is in the parish, on an eminence in a commanding situation, near the road from London to Northampton, one of the crosses erected by Edward I. to the memory of his queen Eleanor; it was, till the restoration of Waltham Cross, the most perfect of the three which remain: it is octangular, on a base of eight steps, and richly ornamented. Near this cross are the traces of a camp, said to be Danish. The river Nene borders the parish; there are commodious wharfs and warehouses on it; and the railroad from Northampton to the Grand Junction Canal passes through it.

Divisions for Ecclesiastical and Legal Purposes.—The county is almost entirely comprehended in the diocese of Peterborough, which (with the small county of Rutland) it constitutes. It is in the archdeaconry of Northampton, the only one in the diocese. A small portion of the county on the south-west border is in the diocese of Oxford. (*Maps appended to the Third Report of the Church Commissioners.*)

That part of the archdeaconry which is in this county comprehends the ten rural deaneries of—1, Peterborough; 2, Weldon; 3, Oundle; 4, Higham Ferrers; 5, Rothwell; 6, Haddon; 7, Daventree; 8, Northampton; 9, Preston; 10, Brackley. There are five deaneries in Rutlandshire: making fifteen in all.

Northamptonshire was antiently included in the diocese of Dorchester, the see of which was removed afterwards to Lincoln. The diocese of Peterborough was taken out of this in the reign of Henry VIII. It is proposed by the Church Commissioners to augment the diocese of Peterborough by the addition of the county and archdeaconry of Leicester, subtracted from Lincoln.

The county is in the Midland circuit. The assizes are held at Northampton, the first town on the circuit to

which the judges proceed. The quarter-sessions are held at Northampton and Peterborough. The county gaol and house of correction is at Northampton. It comprehends eleven yards, eleven airing-rooms, twelve day-rooms, and seven work-rooms. There are borough gaols at Northampton and Peterborough. The number of prisoners committed in the year preceding Oct., 1834, was 655; in 1834, 444; and in 1836, 440.

Nine members were returned to parliament from this county before the passing of the Reform Act, viz. two knights of the shire, two members each for the city of Peterborough and the boroughs of Northampton and Brackley, and one member for the borough of Higham Ferrers. By that act the number of members was reduced to eight, Brackley and Higham Ferrers being disfranchised, and the county formed into two divisions, each returning two members. The northern division of the county consists of the liberty of Peterborough, otherwise the hundred of Nasaburgh, the hundreds of Willybrook, Polebrook, Huxloe, Navisford, Corby, Higham Ferrers, Rothwell, Hamfordshoe, and Orlingbury. The court for the election of the members is held at Kettering; and the polling-stations are Kettering, Peterborough, Oundle, Wellingborough, and Clipston. The southern division comprehends the hundreds of King's Sutton, Chipping Warden, Greens Norton, Cleley, Towcester, Fawsley, Wymersley, Spolhoe, Nobottle Grove, and Guilsborough. The court for the election of members is held at Northampton; and the polling-stations are Northampton, Daventry, Towcester, and Brackley. The extent of the borough of Northampton was unaltered by the Boundary Act: the city of Peterborough was augmented by the addition of such parts of the parish of St. John the Baptist as were not previously included in the city.

History, Antiquities, &c.—In the earliest division of our island it is doubtful whether this county was included in the dominions of the Coritani, or Coritavi (Κοριτανοι, Ptol.), who inhabited Lincolnshire, Leicestershire, and the counties to the northward; or in those of the Catyeuchlani (Κατυευχλανοι), who inhabited Buckinghamshire and Bedfordshire, and the counties to the south and south-east; or in those of the Iceni (Σιμενοι, Ptol.), who dwelt to the east. Perhaps these nations may have occupied each a portion; and the Dobuni (Δοβουνοι) of Gloucestershire and Warwickshire may have also had some parts of the western border. In the Roman division of Britain, Northampton was included in the province of Flavia Cæsariensis. Watling Street crossed in a north-west direction through or near Towcester and Daventry: the Via Devana, another Roman road, parallel to Watling Street, crossed it near Oundle and Rockingham: the Ermine Street, more northerly in its course, crossed the north-eastern extremity from Castor, on the Nene, to Stamford; and one or two other antient roads had a portion of their course in this county. Watling Street may be traced for many miles from the summit of Borough Hill near Daventry. On the London side of Weedon it is incorporated with the modern high-road. Parts of the Ermine Street are conspicuous between Castor, on the Nene, and Upton, and again in the parish of Barnack, not far from Stamford. Several Roman stations are usually considered to have been in the county, viz. the Tripontium, Bennavenna, Isanavatia, and Lactodorum of Antoninus; and the Brinavæ and Durnomagus of Richard of Cirencester.

Tripontium is now by pretty general consent fixed at or near Dow Bridge or Dove Bridge, which crosses the Avon, uniting the two counties of Leicestershire and Northamptonshire. Reynolds (*Iter Britanniarum*) fixes it at the village of Lilburn in Northamptonshire, not far from Dow Bridge, and about half a mile out of the line of Watling Street. There are the traces of a small fort, round which perhaps a town was formed. 'The area' of this fort 'contains about the fifth part of an acre. The southmost part is a square piece of ground, appearing to have been raised, and in its sides answering to the four quarters of the heavens. At the south-east and south-west angles are hillocks which have the appearance of bastions. From one angle to the other runs a bank of earth, and a like bank along the eastern and western sides. To the north-west is a large high mount, on which, according to tradition, there stood a fort or watchtower, of whose demolished walls the churches of Lilburn and Claycoton are said to have been built. Causeys, pavements, and ruins often dug up, show this town to have been formerly larger than at present.' (Bridges, *Northamptonshire*, quoted by Reynolds.) The large high mount here mentioned is called 'the round hill:' it is between Lilburn and Dow Bridge, and is artificial. There are traces of other Roman camps near Lilburn. Various Roman remains have been found in this neighbourhood, at the village of Catthorp or Calthorpe, on the Leicestershire side of the river.*

Bennavenna and Isanavatia (there are many various readings of both names) were most probably the same place, or were at least in the immediate neighbourhood of each other. They are supposed to have been the first a British and the second a Roman town. Bennavenna was probably on Borough Hill, a short distance east of Daventry, on which is one of the largest antient camps or forts existing in the island. The form is very irregular, following the shape of the hill. The outer circumference of the ramparts is rather more than two miles and a quarter; the diameter from north to south one mile, from east to west at the widest point three furlongs; and the whole included area about a hundred and fifty acres. The defences were scarcely in any part confined to a single ditch and rampart: in one part there were as many as four ditches and five ramparts. The ramparts have been much lowered and the ditches filled up by the plough, and in some cases quite levelled. The circumvallation at the northern end of the camp is of a much bolder character than in the other parts. The foundations of the prætorium, or residence of the Roman commandant, were discovered in 1823; and walls, tessellated pavements, and utensils of various kinds were brought to light. They are amply described in Baker's *Northamptonshire*.

The Lactodorum of the Romans, which Stukeley and Gale fixed at Stoney Stratford, has been by later antiquaries fixed at Towcester. Berrymount Hill, an artificial mount on the north-east side of the town, was probably the work of the Romans; but few other Roman antiquities appear to have been discovered. The Brinavæ or Brinavis of Richard of Cirencester may be placed at Black Ground, near Chipping Warden, a village 9 miles from Daventry on the road to Banbury, where Roman coins and a great quantity of pottery have been discovered. A rampart ran north and south near this station for some distance, having a steep side to the west and a gentle slope to the east. It was probably designed for the defence of a frontier, and has been conjectured to have extended about sixteen miles from the Charwell to the Leam. Some small part of this bank is remaining near Warden, and is called Wallow Bank. Arbury Bank, not far off, is probably a part of it; and it is likely that this defence gave name to some neighbouring villages or hamlets, as Walton (Wall-town) near King Sutton, Aston-in-the-Walls, &c.

That a Roman town or station existed at Castor is evident not only from the name, but from the Roman remains, ruined walls, tessellated pavements, urns and other vessels of pottery, and coins in great number found here. Similar remains have been found at Chesterton, or rather at Water Newton in Huntingdonshire, just across the river: either Castor or Chesterton was probably the Roman Durobrivæ mentioned in the Antonine Itinerary: the Map of Antient Britain published by the Society for the Diffusion of Useful Knowledge places Durobrivæ in Huntingdonshire, and the Durnomagus of Richard of Cirencester on the Northamptonshire side: perhaps the two may be identical, and the ruins on the Northamptonshire side the town, which grew out of the station on the opposite bank, or was dependent upon it. [HUNTINGDONSHIRE.] We learn from Tacitus that the Roman general Ostorius Scapula, proprætor in Britain in the time of Claudius, fortified the line of the Nene by a chain of posts. [BRITANNIA.]

Numerous indications of Roman residences or posts may be traced along the valley of the Nene. At Cotterstock, a little below Oundle; at Drayton House, Lowick, near Thrapston; and at Woodford, just above Thrapston—all near or upon the left bank of the river, tessellated pavements or other antiquities have been discovered. At Ringstead near Thrapston, and at Chester in Irchester parish, near Wellingborough, both on the right bank of the Nene, are the remains of camps or posts; and at the latter, fragments of tessellated pavements, coins, &c. have been dug up. At Stanwick, between these posts, fragments of a tessellated pavement have been discovered. At Heyford, on the right bank of the Nene, above Northampton, and at

* In the account of Leicestershire, it is stated that Tripontium was supposed to be at Catthorp, on the Northamptonshire side of the river. It should have been Lilburn, not Catthorp, which latter is on the Leicestershire side.

Piddington, on the road from London by Newport Pagnel to Northampton, pavements have been dug up; and at Cogenhoe, on the right bank of the Nene, below Northampton, some Roman coins and an urn were found. At Weedon-Beck are the remains of a post or station, a large camp (called Castle Dykes), and other antiquities; and on Arbury Hill, in the parish of Badley, near Daventry, is a rectangular camp, generally supposed to be Roman. At Barnack, between Peterborough and Stamford, antiquities have been dug up, and at Weldon have been discovered extensive tessellated pavements, foundations, coins, and other indications of a large mansion or of a town. At Guilsborough, north-west of Northampton, and between Aynhoe and Newbottle, in the southern extremity of the county, there are camps, probably Roman.

It seems not unlikely that several of these posts belonged to the line of defence formed by Ostorius. Durobrivæ may have been the first station above the fens, which formed of themselves a sufficient defence on that side. Ringstead, Chester, Weedon-Beck, and Arbury Hill forts were probably the work of Ostorius; and the post of Isanavatia or Bennavenna we may reasonably suppose to have been fortified by him. At Isanavatia, or at Arbury Hill, at the head of the Nene, the line of defence probably turned southward, past Brinavæ, or Chipping Warden, and the bank and ditch of which there are traces in that neighbourhood may have formed part of it. At what point it turned westward and joined the Severn can scarcely be determined. Raynsbury camp, in the south part of the county, was probably a post on this line.

The county was included in the Anglo-Saxon kingdom of Mercia; and Wulfhere, king of Mercia, had a palace at Weedon-Beck. In the invasion of that kingdom by the Danes, the monastery of Medeshamstede, now Peterborough, was destroyed, and, upon the extinction of the Mercian dynasty, the county was divided between the West Saxons and the Danes, the former having all to the south-west and the latter all to the north-east of Watling Street (A.D. 880 to 883). The Danish part was probably dependent on the community of the Danish burghs; the West Saxon part was governed successively by Ethelred and his widow Ethelfleda, daughter of Alfred, upon whose death (A.D. 920 or 921), Edward the elder, king of Wessex, assumed the direct administration of the government. He fortified Towcester, which was on Watling Street, and therefore a frontier town, and reduced the Danes of Bedford and Northampton to subjection (A.D. 921). At the commencement of the reign of Edmund I., the Danes, whom Athelstan had subdued, revolted (A.D. 942); but those of the Danish burghs, including those of Northamptonshire, submitted to the supremacy of Edmund. By a subsequent treaty, all to the north-east of Watling Street was ceded by him to his Danish competitor Anlaf, but was recovered to the Anglo-Saxons by Edred. Little that is worth notice occurred in the county antecedent to the Conquest; though several towns or other places are mentioned in the Saxon Chronicle or other antient records.

Of the Anglo-Saxon period there are memorials in Brixworth church and the tower of Earls' Barton church: the former will be presently noticed; the latter has been already pretty fully described. Upon the Conquest different lordships in the county were granted to the families of St. Liz and others. Simon de St. Liz built the castles of Northampton and Fotheringay; William the Conqueror is thought to have built Rockingham Castle; and Thorold, a Norman, appointed abbot of Medeshamstede, or Peterborough (which had been rebuilt after its ruin by the Danes, King Edgar and his queen, with the archbishops of Canterbury and York, and a splendid retinue of nobles and clergy, attending at the foundation of the new building), erected a castle within the precincts of the abbey, probably for defence against Hereward le Wake, who had occupied the Isle of Ely. The defence was insufficient; the town was burned and the monastery plundered by the Danes, the allies of Hereward.

In the reign of William Rufus (A.D. 1094) a great council or parliament was held at Rockingham to determine the dispute between the king and Anselm, archbishop of Canterbury, respecting the right of investiture and obedience to the see of Rome. In the following years the principal events occurring in the county were the struggles for the town or castle of Northampton in the civil wars of Henry II., John, and Henry III. Twice in these contests the students of Oxford sought refuge from civil strife within this county. In the reign of John (A.D. 1212) the members of Magdalen College retired to Brackley Hospital, which was in their possession; and in the time of Henry III. many students who, from various causes, had left Oxford, took refuge at Northampton, where steps were taken to establish a new seminary. A similar emigration from Cambridge to Northampton occurred in the same reign, but a royal mandate compelled the students to return. Both Henry III. and Edward I. frequently resided at Northampton; and in the reigns of Edward II. and III. and Richard II. several parliaments were held here: at the last of these was voted the poll-tax, which led to Tyler's rebellion. The battle of Northampton, in the civil war of the Roses (A.D. 1460) has been noticed. Another battle was fought in this county during that contest. The men of the North, excited probably by the intrigues of the earl of Warwick, rose against Edward IV., under a leader called Robin of Redesdale (A.D. 1469). These insurgents defeated a Royalist force, under William Herbert, earl of Pembroke, at Edgecot, on the border of the county towards Oxfordshire. Four thousand of Pembroke's men fell; and himself and other leaders, being taken, were beheaded next day at Northampton. This was the last event of importance in the county before the Reformation.

Of antient ecclesiastical monastic or castellated architecture the county possesses several specimens. Brixworth church, between Northampton and Market Harborough, is one of the most remarkable. It consists of a nave, south aisle, chancel, west tower, and staircase turret on the western side of the tower. The present nave has but one aisle, and that an addition to the original building; but from the foundation of an aisle discovered on the northern side, it appears that the present nave consists of the eastern extremity of the original nave deprived of its aisles, and of a portion if not the whole of the original chancel, and that the present chancel is a subsequent addition. 'The walls are mostly built with rough redstone rag, in pieces not much larger than common brick, and all the arches turned, and most of them covered with courses of red bricks or tiles, as they may be called, precisely similar in quality and size to those found in Roman works discovered in this county; and over the balusters of the window looking from the tower into the nave these bricks are used as imposts.' (Rickman's *Gothic Architecture.*) The church has undergone great alterations; the arches opening from the original nave into its aisles have been for the most part stopped up; the staircase turret, the belfry story of the tower and a lofty spire, and an aisle on the south side of the nave added in later times; windows of various dates, sizes, and styles inserted; and other changes made at various times from the Conquest to the Reformation. It is probable that this church was erected in the time of the Romans; and if so, it is the only ecclesiastical monument of that people in the country, as well as the most antient of our ecclesiastical edifices.

Brigstock Church, between Oundle and Rothwell, is another curious church, but the antient work forms only a small proportion. The tower is of very rough masonry plastered, and has a roughly-built round staircase turret on the west side, like Brixworth. The arch into the nave has large plain blocks for imposts and a projecting stone round the arch: the tower opens into the north aisle by a semicircular-headed plain door, with a small window over it. There are several additions, as a belfry story and spire, of a later date, which present several interesting features.

Barnack church, near Stamford, has a tower probably Anglo-Saxon. The lower part has projecting stone ribs like those of the tower of Earls' Barton noticed in the preceding part of this article. The arch opening into the nave resembles that of Brigstock, but is much more ornamented, with an arrangement of the impost unlike any Norman work, but much like a rude attempt to imitate Roman mouldings.

Castor Church, near Peterborough, is a large and fine cross-church, with a Norman tower at the intersection. This tower displays almost every variety of Anglo-Norman moulding and ornament. The two upper stories present a very enriched appearance, having open arches and continued arcades round. Both the parapet of the tower and the spire are of later date. Other parts of the church, as well as the tower, present very interesting points. St. Peter's church, Northampton, described already, and Peterborough cathedral [PETERBOROUGH], have considerable portions of Norman architecture; also the parish churches of Brockhale, Castle Ashby, Cotterstock, Dodford, East Haddon, Harpole,

Helpstone, Kingsthorpe, Maxey, Moulton, Peakirk, Pitsford, Polbrook, Weedon-Beck, and some others, have more or less of Norman architecture in them. Of these, Castle Ashby, Cotterstock, Maxey, Polbrook, Helpstone, and Pitsford are especially deserving of notice. Barnwell St. Andrew's, Aldwinkle All Saints, Canons Ashby, Easton, Finedon, Fotheringay (formerly collegiate), Lowick, Raunds, Rushden, St. Mary's Church at Stamford Baron, Stanwick, King's Sutton, Tichmarsh, Warmington, Whiston, Wilby, and Wollaston are also worthy of notice for their beauty or for the curious features they present. There are some ruins of the collegiate buildings adjoining to Fotheringay church.

Of St. James's abbey, Duston, near Northampton, founded by William Peverel, natural son of William the Conqueror, for Black or Austin canons (yearly revenue, at the dissolution, 213*l.* 7*s.* 2½*d.* gross, 175*l.* 18*s.* 2½*d.* clear), and of Pipewell Cistertian abbey, Great Oakley, near Rockingham (yearly revenue, at the dissolution, 387*l.* 8*s.* 0½*d.* gross, 286*l.* 11*s.* 8¾*d.* clear), only the foundations and traces of the walls are remaining. A portion of the chapel of Catesby Benedictine nunnery, near Daventry (yearly revenue, at the dissolution, 145*l.* 0*s.* 6*d.* gross, 132*l.* 10*s.* 11½*d.* clear); a portion, supposed to be the refectory, of the Cluniac priory at Daventry (gross yearly revenue, at the dissolution, 236*l.* 7*s.* 6*d.*); the conventual church of the priory of Austin canons at Canons Ashby, between Northampton and Banbury (revenue, at the dissolution, 127*l.* 19*s.* gross, 119*l.* 0*s.* 4*d.* clear); the kitchen and a few other vestiges (now incorporated in a farm-house) of Sewardsley Cistertian priory, near Towcester (yearly revenue, at the dissolution, 18*l.* 11*s.* 2*d.* gross, 12*l.* 6*s.* 7½*d.* clear), are the principal monastic remains. Queen's Cross at Hardingstone has been noticed. Geddington Cross, near Kettering, another of those erected by Edward I. in memory of his wife, is of triangular shape, elevated on eight steps, and divided into three compartments: the lower one solid, adorned with six shields charged with arms and other sculptured ornaments; the compartment above this consists of six pillars rising from an embattled turret, and supporting six decorated canopies; beneath these canopies are placed three statues of the queen. The upper compartment is richly adorned.

The castellated ruins are few. These are the earth-works of Northampton, Higham Ferrers, Brackley, Fotheringay, and perhaps one or two others, and the gateway of Rockingham. Barnwell Castle is a fine and interesting ruin: it consists of four massy round towers, with their connecting walls enclosing a quadrangular court: the western wall is dilapidated. The grand gateway, which still remains, is flanked by two round towers. Some of the antient walls and works of this fortress are in almost as perfect a state as when first built, particularly the entrance gate and some vaulted rooms connected with it.

There are a few antient mansions. Drayton House, Lowick, near Thrapston, is of the age of Henry VI.: it retains many of the features of an antient castle. Fawsley House, 3 miles south of Daventry, the antient seat of the Knightly family, is an incongruous pile of various dates. Northborough manor-house, between Peterborough and Market Deeping, now a farm-house, is of decorated English character, and some of its portions and details are very beautiful.

In the reign of Queen Elizabeth this county was the scene of the execution of Mary of Scotland, who was tried, condemned, and beheaded in Fotheringay Castle. This castle was entirely demolished by order of James I. when he came to the throne. This county possesses several memorials of the public men of Elizabeth's time. Burleigh or Burghley House, on the border of the county near Stamford, was built for the most part by the great Lord Burleigh, though many additions and alterations have been made by subsequent possessors. It is a vast pile, displaying magnificence rather than taste. Kirby Hall, Gretton, near Rockingham, was built by Sir Christopher Hatton, lord-keeper: it has been materially altered since. The more antient parts of Castle Ashby, about 6 miles east of Northampton, were erected by Henry lord Compton. The offices of the manor-house of Ashby St. Ledger (near Daventry) contain a small room in which the gunpowder plot in the time of James I. was concocted. The house belonged to Catesby, one of the leaders in the conspiracy.

The battle of Naseby, which decided the civil war of Charles I., was fought in this county (A.D. 1645). The king had a fortnight before taken Leicester by storm, and, marching southward by Harborough to Daventry, compelled Fairfax to raise the siege of Oxford in order to oppose him. On the approach of the parliamentarian forces under Fairfax and Cromwell to Northampton, Charles retreated to the neighbourhood of Harborough, but finding his enemies close in pursuit, he determined to turn upon them. The battle was fought at Naseby, and each side mustered about 8000 or 9000 men. The right wing of each army, the Royalists under Rupert, the Parliamentarians under Cromwell, was victorious; but while Rupert wasted his advantage by inconsiderate pursuit, Cromwell decided the day by charging the Royalist centre in the flank and rear. The victory was decisive: the Royalists had 800 killed and wounded, the Parliamentarians rather more; but they took 4000 prisoners and all the artillery, besides other spoils of the greatest importance.

After the king had surrendered himself to the Scots at Newark, and been delivered into the hands of the Parliamentary Commissioners, he was brought to Holdenby, or Holmby House, about 6 miles north-west of Northampton. From this place he was carried off by Cornet Joyce, at the head of a party of horse, and taken to the army. Holdenby House, which had been built by Sir Christopher Hatton in the time of Elizabeth, was demolished by order of the parliament, and scarcely any remains are now left.

The only struggle which attended the restoration of Charles II. took place in this county. General Lambert, who had escaped from confinement in the Tower of London, appeared at Daventry with a few troops of horse, but, being attacked by Colonels Ingoldsby and Streater, and deserted by his own men, was captured and re-committed to the Tower.

(Baker's *History of Northamptonshire*; Bridge's *History of Northamptonshire*; *Beauties of England and Wales*; Conybeare and Phillips, *Outlines of the Geology of England and Wales*; Greenough's *Geological Map of England*; Lewis's *Topographical Dictionary*; Rickman's *Gothic Architecture*; Britton's *Architectural Antiquities*; Reynolds's *Iter Britanniarum*; Palgrave's *Rise and Progress of the English Commonwealth*; Sharon Turner's *Anglo-Saxons* and *History of England in the Middle Ages*; *Parliamentary Papers*.)

STATISTICS.

Population.—Northamptonshire is chiefly an agricultural county. In 1831 it ranked the twelfth on the list of agricultural counties: its place in this respect has fluctuated since 1811, when it was the tenth on this list; and in 1821 it was the eleventh. Of 43,793 males twenty years of age and upwards, only 582 were (in 1831) engaged in manufactures, and 21,207 were occupied in agricultural pursuits; out of this latter number 17,775 were labourers. Of the 582 employed in manufactures or in making manufacturing machinery, about 200 were engaged at Kettering in making shoes and weaving silk-shag; about 60 in weaving plush, at Rothwell, Chatcombe, and Eydon; there were 130 at Middleton-Cheney occupied as frame-work knitters, and about 70 more thus employed in other parts; 80 men in making carpets and preparing worsted for that purpose, 20 of them at Spratton, 13 at Hollowell; and there were 50 weavers of miscellaneous descriptions in several villages throughout the county. In the towns of Northampton, Wellingborough, Irthlingborough, and various other places, more than 2000 men were occupied as shoe-makers, in making shoes not consumed in the respective places; but these, for the sake of uniformity, were placed under the head of men engaged in trades and handicrafts, though more strictly speaking they are manufacturers.

The population of Northamptonshire, in each of the following decennary periods, was,—

	Males.	Females.	Total.	Increase per cent.
1801	63,417	68,340	131,757	..
1811	68,279	73,074	141,353	7·28
1821	79,575	82,908	162,483	14·94
1831	87,949	91,387	179,336	10·33

showing an increase, between the first and last periods, of 47,579, or more than 36 per cent. on the whole population; being 21 per cent. below the whole rate of increase throughout England.

The following table exhibits a summary of the population of every hundred, as taken in 1831:—

HUNDREDS, CITIES, LIBERTIES, or BOROUGHS.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males twenty years of age.
Cupping Warden (Hundred)	972	1,059	3	25	671	233	155	2,321	2,376	4,697	1,163
Cleley	1,462	1,633	10	24	960	413	258	3,557	3,856	7,413	1,803
Corby	2,171	2,362	9	62	1,253	557	552	5,149	5,285	10,434	2,573
Fawsley	2,944	3,096	13	73	1,373	992	731	6,787	7,370	14,157	3,363
Greens Norton	1,115	1,186	[illegible]	20	750	274	162	2,638	2,695	5,333	1,386
Guilsborough	2,032	2,219	8	36	1,244	597	378	4,805	4,914	9,719	2,402
Hamfordshoe	1,637	1,753	2	48	498	906	349	4,002	4,176	8,178	1,970
Higham Ferrers	1,555	1,833	12	21	901	678	254	4,042	4,194	8,236	2,057
Huxloe	2,567	2,745	5	75	1,217	975	553	6,192	6,645	12,837	2,998
King's Sutton	2,529	2,705	6	48	1,678	675	352	6,132	6,303	12,435	3,092
Navisford	546	555	5	9	306	154	95	1,338	1,397	2,735	633
Nobottle Grove	1,825	1,929	8	59	1,071	450	368	4,302	4,424	8,726	2,168
Orlingbury	1,178	1,252	3	25	754	304	194	2,834	2,860	5,694	1,365
Polebrook	879	998		27	489	289	220	2,280	2,257	4,537	1,057
Rothwell	1,682	1,781	6	38	897	492	392	3,872	3,988	7,860	2,038
Spelhoe	1,210	1,267		38	683	322	262	2,870	2,980	5,850	1,388
Towcester	977	1,037	6	28	434	435	168	2,360	2,513	4,873	1,152
Willybrook	1,160	1,312	3	18	730	416	166	2,904	2,886	5,790	1,462
Wymersley	1,740	1,912	1	25	1,165	463	284	4,315	4,542	8,857	2,125
Northampton (Borough)	3,091	3,191	28	120	88	2,217	886	7,619	7,732	15,351	3,846
Peterborough (Liberty)	1,952	2,193	16	42	1,162	512	519	5,066	5,005	10,071	2,607
Peterborough (City)	1,128	1,145	5	25	10	519	616	2,564	2,989	5,553	1,146
Totals	36,322	39,163	154	882	18,334	12,895	7,934	78,949	97,387	179,336	43,793

County Expenses, Crimes, &c.—The sums expended for the relief of the poor at the four dates of

		£		s.	d.	
1801	were	94,607,	being	14	4	for each inhabitant.
1811	..	139,675	„	19	9	„
1821	..	145,093	„	17	10	„
1831	..	150,816	„	16	9	„

The sum expended for the same purpose for the year ending March, 1838, was 77,163*l.*: and assuming that the population had increased from 1831 to 1838 at the same rate of progress as in the ten preceding years, the above sum gives an average of 8*s.* 0½*d.* for each inhabitant. These averages are above those for the whole of England and Wales.

The sum raised in Northamptonshire for poor-rate, county-rate, and other local purposes, in the year ending 25th of March, 1833, was 169,614*l.*, and was levied upon the various descriptions of property as under:—

On land	£150,467	3*s.*
Dwelling-houses	15,181	10
Mills, factories, &c.	1,756	13
Manorial profits, navigation, &c.	2,209	2
Total	169,614	8

The amount expended was—

For the relief of the poor	£146,942	4
In suits of law, removal of paupers, &c.	3,742	18
For other purposes	19,93[illegible]	5
Total money expended	17[illegible],[illegible]	[illegible]

In the returns made up in subsequent years the descriptions of property assessed are not specified. In the years 1834, 1835, 1836, 1837, and 1838, there were raised 166,712*l.* 19*s.*, 144,112*l.* 4*s.*, 112,531*l.* 12*s.* (not given for 1837), and 89,419*l.* respectively; and the expenditure of each year was as follows:—

	1834. £	1835. £	1836. £	1837. £	1838. £
For the relief of the poor	140,279	118,842	[illegible]	[illegible]	[illegible]
In suits of law, removal of paupers, &c.	3,211	2,499	[illegible]	[illegible]	[illegible]
Payments towards the county-rate	22,288	9,332	7,[illegible]	[illegible]	[illegible]
For all other purposes		13,123	10,440	[illegible]	[illegible]
Total money expended	£165,778	143,796	[illegible]	[illegible]	[illegible]

The saving effected in the sum expended in 1838, as compared with that expended in 1834, was therefore 72,815*l.*, or not quite 44 per cent., and the sum expended for the relief of the poor in 1838 was less than that in 1834 by 63,[illegible]*l.*, or more than 45 per cent.

The number of turnpike trusts in Northamptonshire, as ascertained in 1836, under the acts 3 and 4 William IV., c. 80, were 27; the number of miles of road under their charge was 358. The annual income arising from tolls and parish composition in lieu of statute duty, in 1835, was 37,990*l.*, and the annual expenditure in the same year was as follows:—

Manual labour	£11,671	2
Team labour, and carriage of materials	3,038	2
Materials for surface repairs	6,923	5
Land purchased	26	4
Damages done in obtaining materials	436	0
Tradesmen's bills	1,308	19
Salaries of treasurer, clerk, and surveyor	2,302	16
Law charges	641	16
Interest of debt	3,161	7
Improvements	769	19
Debts paid off	2,930	4
Incidental expenses	1,006	0
Estimated value of statute duty performed	2,446	2
Total expenditure	36,701	16

The county expenditure in 1834, exclusive of that for the relief of the poor, was 6801*l.* 6*s.*, disbursed as follows:—

Bridges, building, repairs, &c.	£728	10
Gaols, houses of correction, &c., and maintaining prisoners, &c.	2,181	4
Shire halls, and courts of justice, building, repairing, &c.	115	9
Prosecutions	1,684	9
Clerk of the peace	245	12
Conveyance of prisoners before trial	470	12
Conveyance of convicts	195	0
Vagrants, apprehending and conveying	93	2
Coroner	151	18
Miscellaneous	935	10
Total expenditure	6,801	6

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 765, 927, and 1219 respectively, making an average of 109 annually in the first period, of 132 in the second period, and of 176 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 49, 54, and 51 respectively. Among the persons charged with offences there were committed for

	1831.	1832.	1833.
Felonies	44	48	48
Misdemeanors	5	6	3

The total number of committals in each of the same years was 77, 72, and 53 respectively.

	1831.	1832.	1833.
The number convicted was	58	55	39
Acquitted	13	14	7
Discharged by proclamation	6	3	7

There were 268 persons charged in 1838 with crimes at the assizes and sessions in Northamptonshire. Of these 38 were charged with offences against the person, 24 of which were common assaults; 18 were charged with offences against property committed with violence; 191 with offences against property committed without violence; only 2 were charged with malicious offences, 1 for uttering counterfeit coin; and 24 for various misdemeanors.

Of the whole number committed, 188 were convicted, 56 were acquitted, 3 were not prosecuted, and no bill was found against 20. Of those convicted, 2 were sentenced to death, but their sentence was commuted into transportation for life; 31 were transported for various periods; 2 were sentenced to two years; 28 to one year; and 115 to six months and under; 10 were fined, and 1 was found insane. Of the whole number of offenders, 234 were males and 34 females; 104 could neither read nor write; 148 could read and write imperfectly; 15 could read and write well; and one had received superior instruction.

The number of persons registered in 1837 to vote for county members was 8457. Of these, 5620 were freeholders, 41 leaseholders, 654 copyholders, 2021 occupying tenants, and 121 annuitants, being 1 in 21 of the whole population, and 1 in 5 of the male population twenty years of age and upwards, as taken in 1831.

Northamptonshire contains three savings' banks: the number of depositors and amount of deposits on the 20th of November, in each of the following years, were as under:—

	1832.	1833.	1834.	1835.
Number of depositors	4,331	1,203	4,920	5,022
Amount of deposits	£155,297	£37,873	£159,199	£160,271

The various sums in the savings' banks in 1836, 1837, and 1838, were distributed as under:—

	1836.		1837.		1838.	
	Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	2,992	£21,129	3,115	£[illegible]	3,378	£23,[illegible]
" 50	1,413	42,414	1,600	[illegible]	1,867	52,1[illegible]
" 100	604	42,143	637	[illegible]915	[illegible]	46,[illegible]
" 150	192	23,12[illegible]	210	24,944	1[illegible]	27,8[illegible]
" 200	109	19,61[illegible]	100	18,051	11[illegible]	19,725
Above 200	66	19,636	70	[illegible]75	[illegible]	18,416
	5,376	167,499	5,732	175,[illegible]	6,0[illegible]	[illegible]742

Education.—The following summary is taken from the Parliamentary Returns on Education made in the session of 1835.

	Schools.	Scholars.	Total.
Infant schools	132		
Number of children at such schools; ages from 2 to 7 years:—			
Males		636	
Females		[illegible]	
Sex not specified		[illegible]	
			2,184
Daily schools	544		
Number of children at such schools; ages from 4 to 14 years:—			
Males		8,471	
Females		5,186	
Sex not specified		2,454	
			16,111
Schools	676		
Total of children under daily instruction			18,295
Sunday-schools	406		
Number of children at such schools; ages from 4 to 15 years:			
Males		11,663	
Females		11,668	
Sex not specified		5,021	
			28,352

Assuming that the population between the ages of 2 and 15 years has increased in the same proportion as the whole of the population since 1821, and that the whole population has increased in the same ratio since 1831 as in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 years thus found as residing in Northamptonshire in 1833 was about 60,307.

Sixty-seven Sunday-schools are returned from places where no other school exists, and the children, 2974 in number, who are instructed therein cannot be supposed to attend any other schools; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Fifty-one schools, containing 3418 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is known to be thus far created. Making allowance therefore for this cause, which prevents accuracy, we may perhaps fairly estimate that about two-thirds of the children between the ages of 2 and 15 years are under instruction in this county.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars		Subscrip. and payment from scholars	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	7	81	8	523	112	1,353	5	227
Daily Schools	111	3,630	56	3,031	345	7,256	32	2,171
Sunday Schools	39	2,267	356	24,209	—	—	11	1,876
Total. . . .	157	5,978	420	27,783	457	8,609	48	4,277

The schools established by Dissenters, included in the above statement, are

			Scholars.
Infant schools	2	containing	84
Daily schools	15	"	308
Sunday-schools	110	"	8,505

The schools established since 1818 are

			Scholars.
Infant and other daily schools	279	containing	8,131
Sunday-schools	215	"	17,245

Twenty-four boarding-schools are included in the number of daily-schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists and Roman Catholics.

Lending-libraries of books are attached to 23 schools in this county.

NORTHCOTE, JAMES, an English artist and writer on art, was born in 1746, at Plymouth, where his father was a watchmaker. Having been introduced to Sir Joshua Reynolds through Dr. J. Mudge, he went to London at the age of twenty-five to study painting under him, and was for five years not only his pupil but his inmate. This circumstance was of no small advantage to him, as it not only tended to refine his manners, but brought him into contact with the first society of the day. On quitting Reynolds he at first set up as a portrait-painter, and would no doubt have become eminent in that branch of the art, as he possessed much insight into and power of describing individual character. But his ambition prompted him to aspire to something higher than taking likenesses. He accordingly set out for Italy, where he spent about five years, and was made a member of the academies of Florence and Cortona. On his return he was encouraged by Boydell, who published many engravings after subjects painted by him, and among others that called the Village Doctress, which was for a long time an exceedingly popular print. For the Shakspere Gallery he produced two of his best works, the Murder of the Two Princes in the Tower, and Hubert and Arthur,

besides some other subjects. Yet although he displayed considerable skill in composition and colouring, together with vigour of expression, his ability in art was by no means equal to his enthusiasm and his application. For nearly half a century he existed almost entirely in his painting-room in Argyle Street, and would have been content, as he himself said, to live on so for ever in what was to him all-sufficient enjoyment. In the latter part of his life he was quite a recluse, and independent both in spirit and circumstances—the latter chiefly owing to his prudence and frugality. He was apt to be somewhat cynical, though really kind-hearted. Hazlitt's 'Conversations' with him afford the best portraiture of his character and of the qualities of his mind. His literary productions are far from being inconsiderable. Many papers of his appeared in a work entitled 'The Artist,' and in 1813 he published his 'Memoirs of Sir Joshua Reynolds, with an Analysis of his Discourses,' a quarto volume, to which he afterwards added a supplement. In 1828, at the age of eighty-two, he again appeared as an author, with his 'One Hundred Fables, original and selected,' which, though of little interest as a literary performance, is a book of great attraction on account of the very numerous and exquisite wood-cuts, all which were executed after his own designs, and were superior to any embellishments of the kind that had then appeared. A second set was published after his death, according to his instructions in his will. As if to convince the world that he was not only still living, but unwearied by his long career, he published, in his eighty-fourth year, his 'Life of Titian,' a work which contains much information relative to painting and to art generally. Neither did he lay aside his pencil, but may almost be said to have died with it in his hand, since he continued to amuse himself with it till within a day or two of his death, which happened at his house in Argyle Street, July 13, 1831. Northcote was never married, but lived with his maiden sister, who survived him.

NORTHUMBERLAND, a northern county of England. It is bounded on the north by Norhamshire and Islandshire, two divisions which constitute a detached part of the county of Durham; on the east by the North Sea or German Ocean; on the south by the county of Durham, from which it is separated in one part by the Tyne, in other parts by the Stanley Burn and the Derwent, feeders of the Tyne; on the south-west by Cumberland, from which in one part it is separated by the Irthing, which flows into the Eden; and on the north-west by the Scotch counties of Berwick and Roxborough, from the former of which it is in one part separated by the Tweed. Its form, if the small detached part of Durham be taken with it, is triangular, the base, resting on the county of Durham, and the vertex being at the bounds of the town of Berwick. The length of the base, from the mouth of the Tyne to Blacklaw Mountain on the border of Cumberland, is 47 miles; that of the side from the mouth of the Tyne to Berwick bounds, 60 miles; and that of the remaining side, 70 miles. That portion of the district whose form and dimensions are here given which belongs to the county of Durham is very small.

The area of the county of Northumberland is estimated at 1871 square miles; the population in 1821 was 198,965; in 1831, 222,912, showing an increase in ten years of 23,947, or 12 per cent., and giving 119 inhabitants to the square mile. In size it is the fifth of the English counties; in amount of population the twenty-fourth; and in density of population the thirty-eighth.

Newcastle, the county town, is on the Tyne, about 240 miles in a direct line north by west of London, or 273 miles by the mail-road through Ware, Huntingdon, Stamford, Grantham, Newark, Doncaster, York, Thirsk, Northallerton, Darlington, and Durham. [NEWCASTLE.]

Surface, Geological Structure, and Hydrography.—Northumberland is a rugged county. The highest hills are on the north-west border, towards Scotland. They are commonly designated the Cheviot Hills, which name is in strictness limited to one group among them. They extend from the neighbourhood of Wooler towards the south-west. The Cheviot Hills, properly so called (2657 feet high), are near the northern extremity. Biers Hugh, Hedgehope (2347 feet high), the Hartside Hills, Standrop, Rowhope, Cawlshope, and many others are near the Cheviot, but more to the southward; Lumsden Hill (725 feet high), Carter Hill, Three Pikes, Tronting Crag, Peel Fell, Grannkus, Baron's Pike, and others, are to the southward of these, approaching the Cumberland border. These hills have in several instances a conical form, and some are nearly perfect cones; they are covered with a fine green turf, and afford excellent pasture for sheep. Another range of hills, nearly parallel to the range just described, extends from the east of the junction of the Till with the Tweed southward to the bank of the Tyne. In the northern part they bear the name of the Divot Hills; in the centre they form the high lands of Eglingham Common, Rothbury Forest, the Simonside Hills (1407 feet high), and Harwood Moor; more to the south are Ottar Caps and Tone Crag. Black Heddon, near the Divot Hills, is 646 feet high. Branches from these hills extend eastward toward the sea; Rutllaw, in one of these branches near Morpeth, is 595 feet high; and Alnwick Moor is 808 feet high. The hills south of the Coquet form part of the extensive moorlands which occupy a third part of the county, and have an average elevation of from 500 to 1000 feet above the level of the sea.

South of the Tyne is a group of hills separating the valleys of the Tyne and the Wear. The Wolf Hills, part of this group, approach the right or east bank of the South Tyne. On the opposite side of the valley of that river are the high lands of Geltsdale Forest, which are partly in this county and partly in Cumberland.

The coast is low. There are no cliffs except very low ones throughout its whole range. From the mouth of the Tweed at Berwick it runs south-east to Sunderland Point. In this part are two bays: the larger, opposite Holy Island; the other, Budle Bay, into which a little stream, the Warnburn, flows, is more to the south-east. Holy Island and the Farne Islands are noticed elsewhere. [DURHAM.]

From Sunderland Point the coast runs south by east to the mouth of the Tyne. It is marked by some headlands and bays; Beadnell Point, the headland of Dunstanborough Castle, Bulmer Bay, Alnmouth Bay, Hawksley Point, south of which is Druridge Bay, Newbiggin Point, and Seaton Road. Coquet Island lies off Hawksley Point. It is nearly a mile long from north to south, and about half a mile broad. It had formerly a religious house, a cell to Tynemouth; there was also a fortress, the ruins of which have been converted into a dwelling-house and lighthouse. It contains some rich pasture, and abounds in rabbits. Coal was dug in Leland's time.

The south-eastern part of the county, bounded by a line drawn from Warkworth, at the mouth of the Coquet, by the head of the river Blyth, to the Tyne, and from thence southward to the bank of the Derwent, is included in the great coal-field of the counties of Northumberland and Durham. [COAL-FIELDS.] This coal-field is skirted on the north-west by a belt of land occupied by the millstone-grit. The thickness of this formation is probably 900 or 1000 feet at least. The prevailing rock of the series is shale, known by the provincial name of plate, with which occur various beds of sandstone, differing in hardness and texture, and, according to these differences, distinguished as freestones, hazles, whetstones, grindstones, and millstones. Beyond the millstone-grit district is a belt of land, still narrower than the foregoing, occupied by the carboniferous or mountain limestone. This is marked in Mr. Greenough's 'Map' as skirting the millstone-grit, from the sea at Alnmouth to the southern border of the county, where it expands over a greater extent, occupying the valley of the Tyne and the country south of it from the border of Cumberland to below Hexham. Nearly all the rest of the county is occupied by a series of formations comprising sandstones of various kinds (one of them resembling the sandstone of the millstone-grit series), limestone, slaty clay, shale, and coal. The relative position of these beds is not ascertained. The coal worked in this formation is slate coal, and is considered inferior in quality to that of the Northumberland and Durham coal-field. Conybeare and Phillips refer these beds to the millstone-grit series.

Trap-rocks occur in connection with both coal formations, either as overlying masses, resting unconformably on the subjacent strata; as dykes, irregularly intersecting the strata; or as beds conformably interstratified and regularly alternating with the other strata. A small district along the Tweed is occupied by the new red-sandstone.

The principal mineral product of this county is pit-coal, of which the chief part raised is sent coastwise to London and to various ports of the southern and eastern counties which do not produce coal. [COAL-FIELDS; COAL TRADE.] The principal pits in the great coal-field are in the neighbourhood of the Tyne.

There are many pits in the millstone-grit and carboniferous limestone districts, and in the inferior coal formation which crops out from beneath them and overspreads so large a portion of the county. Some gypsum is obtained in the red-sandstone district, near the Tweed; and there are lead-mines in the carboniferous limestone at Allendale, near the border of Durham [ALLENDALE], and in other places. The ores of zinc abound in most of the veins producing lead. There is abundance of ironstone in the strata which occur in the coal-measures. Limestone is dug in many parts, and stone for various purposes is quarried in the principal coal-field.

The rivers of Northumberland rise for the most part in the eastern slope of the hills of the north-western boundary, and flow eastward across the county to the German Ocean. The Tweed lies to the west of this range, and belongs chiefly to Scotland. For a short distance however, near Coldstream, it skirts the border of Northumberland and of that detached portion of Durham which adjoins Berwick. The tide flows up to Norham Castle, but vessels of forty or fifty tons get up to New Water ford only, six miles above Berwick.

The Till rises in the eastern slope of the border range, near the Hartside Hills, and, under the name of the Bremish, flows first eastward, then northward; on reaching the neighbourhood of Belford it turns north-west and, assuming the name of Till, flows into the Tweed. It receives the Roddam Burn and the Lil Burn, and the Beaumont or Glen river, the last from the west side of the hills. The Till is nearly 40 miles long.

The Aln rises at Alnham, near the foot of the border range, and flowing eastward 20 miles, past Alnwick, falls into the sea at Alnmouth. The Coquet rises in the border range, and flowing first south-east, then bending to the east past Rothbury, and then flowing again to the north-east, falls into the ocean just below Warkworth, after a course of about 37 miles. The Aln and the Coquet are both navigable for a short distance, the former up to Alnwick. There is a salmon fishery at the mouth of these rivers, and the Aln abounds in trout.

The Wensbeck or Wansbeck rises in the hills which run through the centre of the county, and flows east past Morpeth, where it becomes navigable, into the German Ocean. Its whole length is 24 miles, the length of the navigation 6 miles. The Blyth rises in the same range of hills as the Wensbeck, and has a course of above 20 miles nearly parallel to that river, more to the southward. It is navigable a short distance from the mouth. The Pont is a small stream, flowing into the Blyth. The parish of Bedlington, or Bedlingtonshire, between the mouths of the Wensbeck and the Blyth, belongs to the county of Durham. The Seaton Burn is a short stream, 11 or 12 miles long, to the south of the Blyth, with which it communicates near its source. It flows into the sea at Seaton Sluice, or Hartley new harbour.

The North Tyne rises from several springs, some of which are just within the Scottish border, some in Northumberland but close on the border, and after flowing southward under the name of the Keelder Burn for 10 miles, turns eastward and flows 14 miles to just below Bellingham, where it receives the river Reed from the border of the county, 22 miles long; from this point the stream flows south-east 14 miles to the junction of the South Tyne, just above Hexham. The South Tyne rises amid the hills south of Aldstone Moor in Cumberland, and after flowing 17 miles northward to Haltwhistle, turns eastward and flows 16 miles to its junction with the North Tyne. It receives the Allen and some other small streams. The united stream flows in a tolerably direct eastward course of 30 miles, past Newcastle into the sea between North and South Shields. Its whole length from the head of the North Tyne is about 72 miles. It is navigable for sea-borne vessels up to Newcastle, and for river craft a few miles higher. The salmon fishery on this river was formerly celebrated, but is now nearly if not quite destroyed. The spring-tides rise about 13 feet at the mouth of the river and about 11½ feet at Newcastle.

The salmon fishery of the Tweed is very important, and a considerable number of boxes of that fish packed in ice are sent from this river to the London market, beside what is pickled or dried. There is a fishery for salmon-trout and grilse, or small salmon, at Warkworth on the Coquet.

The vale of the Coquet is noted for the excellence of its agriculture; the vale of Tyne exhibits great variety of scenery; above Newcastle it is rich and beautiful.

There are no canals in Northumberland, but there are many railroads. The most important is the Newcastle and Carlisle Railroad. It follows the valley of the Tyne and South Tyne, partly on the south, partly on the north side of the river, and passes by Hexham and Haltwhistle. Its whole length is about 60 miles, the greater part in this county. The Act was obtained in 1829 and the railway was opened in June, 1838. The number of passengers who travelled by this railroad in 1838 was 196,051. A railway from Newcastle to North Shields, above seven miles long, was opened in 1839. It is 6½ miles long, and passes under the Shields road by a tunnel 70 yards long. The number of passengers by this railroad averages nearly 2500 daily. The Brandling Junction Railway, which unites Gateshead with South Shields and Monk Wearmouth, was also opened in 1839. Most of the other railways are short, and serve for the conveyance of coal from the different pits to the Tyne, the Blyth, the Aln, and the Tweed. Two railroads from Newcastle to Edinburgh have been projected, one near the coast by Morpeth, Alnwick, and Berwick-upon-Tweed; the other, more inland, following the valley of the Reed near Otterburn. The Great North of England Railway is to unite York with Newcastle, or rather with Gateshead on the south bank of the Tyne, opposite Newcastle. The Gateshead and Durham Railway, for which an act has been obtained, forms part of this line.

The Edinburgh mail-coach road enters the county at Newcastle, and runs northward through Morpeth, Alnwick, and Belford, to Berwick-upon-Tweed. Another road to Edinburgh branches off from this beyond Morpeth, and runs by Wooler to Coldstream. A third road to Edinburgh runs from Newcastle by the valley of the Reed to Jedburgh. The coach-road from Newcastle to Carlisle runs by Hexham and Haltwhistle.

Agriculture.—The position of this county, in the north-eastern extremity of England and along the coast of the German Ocean for upwards of sixty miles, causes the climate to be considerably colder and the harvest later than in the southern and midland counties. In that part of the county which skirts the sea-shore, although it is exposed to cold easterly winds, the air is much milder and more genial than in the western and mountainous part, which, although too high and bleak for cultivation, beyond a certain elevation, produces sufficient herbage to maintain large flocks of hardy sheep, known by the appellation of the Cheviot breed.

Along the coast and for some miles inland the soil consists of a strong fertile clayey loam well adapted to the growth of wheat, beans, and clover, and there are some excellent natural meadows and pastures.

Along the banks of the Tyne and the Coquet, and along the Aln from Alnwick to the sea, the soil is chiefly a light gravel, sand, or dry loam, which is likewise the case to a great degree in the vales of the Beamish, Till, and Beaumont. In the middle and south-eastern parts of the county the soil is a moist loam on a cold impervious clay bottom, which is of inferior value until it has been improved by draining and careful cultivation. In its natural state it produces inferior pasture unfit for sheep, which are subject to the rot when turned out upon it, but it is better adapted for young cattle, which may be reared but not fattened on it. On the hills, which are in a state of nature, there is a mixture of low peat-bogs, stony and gravelly heaths, and some good dry green pasture well adapted for sheep feed.

The county of Northumberland has been one of the foremost of the English counties in adopting the improved system of agriculture, the chief feature of which is the cultivation of turnips for the rearing and fattening of cattle. Turnips accordingly occupy a large proportion of every farm the soil of which admits of this cultivation. So great has been the advantage derived from this change from the old triennial system, that many fields now yield heavy crops of this useful root which in most other parts of England would be considered as totally unfit for its cultivation. This has arisen from the early adoption of the culture in rows on elevated ridges, which has received the general appellation of the Northumberland method, and which we shall therefore describe with some minuteness.

The ground having been prepared by as many ploughings and harrowings as may be thought requisite to pulverise it and destroy the weeds, and laid quite flat, an experienced ploughman draws as straight a furrow as possible and returning lays the next furrow slice upon the first, thus completing what is usually called a *bout*. The usual width of

the furrow being nine inches, the first ridge and furrow take up 18 inches; the next furrow slice being laid over the first, the whole work takes a width of 27 inches. He then enters again at the distance of 27 inches from the land side of the first-made furrow, and completes a second bout parallel to the first. When the whole field is thus laid into narrow ridges, which, from the soil being light and crumbling, gives the section of the surface a waved appearance, such as



is represented in the annexed cut, the depressions are about 6 inches below the former surface and the ridges as much above. This at once doubles the depth of the cultivated soil in the ridges. The manure is now brought on the land in small one-horse carts, the wheels of which are about 54 inches apart, so that the horse walks in one furrow while the wheels move in the two adjoining. The manure, which is chiefly common farm-yard dung, not too much decomposed, especially if the soil is inclined to clay, is laid in small heaps, drawn out of the cart by a dung-hook, or, which is better, by a boy standing on the load in the cart, who forks it out more regularly as the horse goes slowly on. It is then laid equally in the furrows by women and boys. The quantity thus laid on, depends on the supply of the yard compared with the breadth of turnips intended to be sown, for the whole is expended on this crop. In general, not less than 15 or 20 single-horse loads per acre are thought necessary to produce a good crop. Twice that quantity is often put on. This dung is evenly distributed in the furrows to the right and left of that in which it has been deposited from the cart. The ploughman now begins to cover this dung by splitting the ridges in two, laying one half to the left and the other to the right, and reversing the bouts, so that the ridges are now directly over the dung, which is completely buried. The appearance of the field after this is exactly similar to what it was after the first bouting. A roller is now drawn over the ridges, to flatten them at top, in order that they may better receive the seed, which is drilled exactly on the middle of the ridge by a machine attached to the frame of the roller and dragged after it. The roller is usually sufficiently large to roll two ridges at once, and, in that case, two drilling-machines, each guided by a man, are fixed to it, and one horse, walking in the middle furrow, draws the whole apparatus forward. Thus, two men and a horse, with a boy to lead the latter, can drill four or five acres in one summer's day. The drill barrow has a very slight coulter, hollowed out at the back part to receive the tin tube through which the seed is delivered. The simplest construction of that part which distributes the seed is a tin cylinder, or rather double cone, with holes in the circumference, through which the seed falls into the tube. The seed-box revolves on an axis turned by means of a connection with the axis of one of the wheels of the machine, which revolves with it; the other wheel turns round this axis. As long as the first-mentioned wheel goes on the ground the seed is delivered, but as soon as it is raised, so that the drill proceeds on the other wheel alone, no seed falls through, because the axis no longer turns. Thus none is lost in turning at the ends of the ridges. In very light soils another slight rolling is necessary to press in the seed; but in stiffer loams a small chain or piece of iron dragged after the coulter is sufficient to cover the seed, without rolling. By this method the seed has not only a greater depth of mellow soil to strike in, but the fermentation of the dung immediately under it acts as a hot-bed and soon brings it up; by which means it generally is so rapidly in the rough leaf, that it seldom suffers from the depredations of the fly. Experience shows that in a moist climate the ridge system produces much more certain and heavier crops than could be expected in general from the most careful broad-cast culture. As soon as the turnip has four leaves out of the ground, the rows may be thinned by the hand or by the hoe, and the plants may be left from eight to ten inches apart. The next process is stirring the ground between the rows with a light one-horse plough. This plough takes a small shallow furrow to the left of the row, within three or four inches of the young plants, and lays it in the middle of the interval between the ridges. When this has been done on both sides all over the field, there will be small ridges formed between the principal ridges on which the turnips grow. All weeds are thus buried, except between the plants in the rows, where they are taken out by the hand or hoe. Some time afterwards, a narrow cultivator, like harrows with crooked tines, which are called *cats' claws* from their shape, is drawn over the last-made ridge to pulverise the earth and clear it from all remaining weeds; this is repeated more than once, if it should be thought necessary. Before the autumn rains set in, or the turnips have too wide spreading tops, a plough with a double mould-board is drawn along the middle of the intervals, and lays half of the pulverised soil on each side against the ridge on which the turnips grow; not to cover the roots and protect them from frost, as some think, but to supply fresh mellow earth for the extending fibres of the root to strike into. In heavy wet loams it may be necessary, in order to make a clean neat furrow between the rows, to let off any surface water, in the latter end of the season with a double mould-board plough, and dig out deeper water-furrows with the spade across the ridges, where they may be required by the nature of the surface. But this is not often necessary in common turnip soils. By following the above system, Swedish turnips and even common white turnips may be raised with success on the heaviest soils; and if taken up early, and stored for winter use, they will leave the land in as good a state for wheat, with one or two ploughings, as if it had been fallowed. The carts which take off the turnips will not hurt the land, for the horse walks in a deep furrow, and the wheels move in similar ones, and thus the mellow earth is not trod upon. In order that the dung, which is not yet fully decomposed, may be spread evenly for the next crop, the ridges are often made in a diagonal line across the usual line of ploughing. When the turnips are off, one bout of the plough levels each of the ridges, heavy harrows level the whole, and it can be ploughed in proper stitches for the sowing of the next crop. Sometimes wheat is sown immediately, but more frequently barley with clover-seed in spring. In the latter case the Swedish turnips may be left on the ground all winter, and taken up or fed off early in spring.

Though you may traverse the whole of Northumberland without meeting with a single field of turnips sown broad-cast, the drilling of other crops is by no means so common as in Norfolk and Suffolk, where most of the turnips, on the other hand, are still sown broad-cast. The expense of the machines for drilling corn may be one cause of this, but it seems not sufficient to account for it.

It is well known to all good farmers that all the subsequent crops depend on the success of the turnips. These are the source from which manure is provided, and no crop will keep so much cattle during winter and early spring, with so little exhaustion of the soil, as turnips. The manure abundantly put on the land to raise the turnips is a fund laid out at great interest for the benefit of the future crops; for the whole course is benefited by them, especially if they are fed off by folding sheep on them. Whether wheat or barley is sown after turnips, clover and grass-seeds are usually sown amongst it. The land being clean and in good heart, the grasses grow thickly and cover the ground well the year after. In the heavier loams, after the grasses have been once mown for hay, the land is depastured for two or three years, and then it is ploughed once and sown with oats. After oats come beans, with some manure, and wheat ends the rotation. This is considered the best course for keeping the land in a state of progressive improvement. On very rich soils another crop of beans or peas may be taken after the wheat, and then wheat or oats again. Few soils however, except the richest and deepest, will bear this exhausting course; and it is more prudent in general to return to the turnips after the first crop of wheat.

On light gravelly soils, where the clover and grasses soon fall off, the Norfolk system answers best. The turnips are fed off with sheep, or, where the crop is heavy, half the turnips are drawn for oxen and cows, and the other half fed off; or, which is a late improvement, they are cut into slices or strips by a machine, and given to the sheep with cut clover-hay in shallow troughs on the ground from which the turnips were drawn. In this way the turnips go much farther; and lambs and old ewes will thrive and fatten on them, which they could not have done in the old way for want of teeth to bite them. After turnips come barley and broad clover, with a small portion of annual rye-grass, mown once for hay and ploughed up for wheat. The next course is the same, with the variation of some substitute for the broad clover, which should not be sown on the same land oftener than once in eight years to ensure good crops. Part

of the land may be in peas or tares to cut green, and part in grass-seeds without clover, according to the judgment of the farmer. There are some very heavy and wet soils in the county, which will not readily bear turnips, and where the sheep cannot be folded in winter, nor the turnips carted off without greatly injuring the land. There a fallow is unavoidable at least once in six or seven years. In other respects they are cultivated in a similar manner with the good loams. The practice of thorough draining, which is spreading rapidly, will probably soon banish clean fallows, and substitute turnips in their place, even in the most retentive soils, which will in time be converted into rich loams by the effect of cultivation, loaming, manuring, &c., as may be seen in many old gardens, of which the natural soil was once a retentive clay.

Potatoes are raised to a considerable amount on some very good sands and loams. They require land in good heart; for whatever may have been said or written to the contrary, they very much exhaust the land, and should not be repeated oftener than once in ten or twelve years on the same spot. The best land to plant potatoes in for human food is that which is broken up from two or three years' old grass. For cattle they may occupy a portion of the turnip-field, and be cultivated in similar ridges, with this difference, that the sets, or cut potatoes, are put immediately on the manure in the furrow, and covered over with four or five inches of earth by the plough. As they rise out of the ground they are moulded up by the plough; and this is repeated, with a plough made on purpose, with two very wide mould-boards, as often and as deep as the soil will allow. Thus 400 bushels, or twenty tons, of the large cattle-potatoes may be raised on an acre of good land: they are good for every kind of stock when boiled or steamed. Although the immediate profit in this way is much inferior to that of a smaller crop of more edible potatoes, sold in the market, the manure produced amply makes up for the difference, unless potatoes sell at a high price, as is the case near manufacturing towns.

The instruments of tillage are mostly of improved make. The ploughs are generally iron swing-ploughs, on the principle of the old Rotherham plough, which was copied from the Belgian plough, and improved by Small and others. The harrows, rollers, scarifiers, &c. are as in other counties. The turnip-drill has been described, and there are various improvements daily made in the construction. The best sows two rows at once, and has a roller before and one behind, thus combining all the necessary operations connected with the depositing of the seed. Single-horse carts are more common than any others, and used for all purposes, especially the conveyance of lime and other manures from a distance. Bones ground to a moderate size are now extensively used as a manure for turnips, especially on dry gravelly soils; and they have greatly improved all the crops, by securing that of the turnips, at a much less expense of farm-yard dung. Threshing-machines, moved by water, wind, or horses, are thought essential on the larger Northumberland farms; and there is no prejudice against them amongst the labourers, but on the contrary. The labourers are industrious and honest: they are mostly paid partly in grain, by the keep of a cow, and a cottage rent-free, with other advantages. [BERWICKSHIRE.] The unmarried servants are boarded on the farm, as in Scotland.

There are not many meadows, properly so called, in Northumberland, and few are artificially irrigated. Some rich upland pastures are mown annually, or every two or three years, for hay, and fed off the remainder of the time. Some are occasionally invigorated with manure, chiefly composts of earth, lime, and dung, well mixed and incorporated, which is put on in winter, when farm-work is slack, or, which is better, immediately after the hay is taken off, when it is soon washed in by the autumn rains. The hay produced from clover and artificial grasses, of which there is a considerable quantity on all well-managed farms, furnishes the great supply of winter fodder for horses, and is a useful addition to the turnips for feeding cattle.

The cattle in Northumberland are generally of good breeds, mostly short-horned. Those bought to fatten are chiefly Scotch. In noticing the cattle of this county we cannot pass over the wild breed, in the earl of Tankerville's park at Chillingham. They are mere objects of curiosity, never having been made useful for farming purposes; nor does it appear that they have been used with any advantage for crossing with domesticated breeds. They are of a light cream colour, with black muzzles. Their flesh is said to be good and succulent, when they are killed in condition, which must be done by shooting them like deer. The cows kept for the dairy are almost invariably of the short-horned Durham breed; and many remarkably fine heifers are reared in the county, some of which travel southward and supply the large dairies of the London milkmen. The calves are reared on milk at first, gradually mixed with water and meal, till they can live on grass alone and run in the pastures. The first winter they have turnips and straw, and are often sold in calf and in good condition the ensuing autumn. If they are kept over the second winter, they have the same food as in the first, with the addition of a little hay occasionally. They are then kept for private use as dairy cows, or sold with their young calf soon after calving, which is generally in April or May. Great attention is paid by some breeders to have a good bull; and very high prices are given for the use of one of a good breed and with *good points* for one season. The breeding of bulls is a separate business, and requires much experience and judgment.

Excellent farm-horses are bred in Northumberland. They are active, with clean legs, and are very muscular and hardy. Four fat horses in a plough or team, such as are seen in Kent, would be a curiosity in the northern counties. They like fat bullocks, but prefer hard wiry sinews in horses. It is not often that a plough is seen with more than two horses yoked to it, and this only for trench or subsoil ploughing, a practice which is beginning to gain ground, as the next improvement after complete draining. The horses are not permitted to be idle. The example of those who work in the collieries teaches the farmer what horses can do: and if they are worked harder than in the south, they have a larger quantity of corn given them. A horse in a single cart will go to a distance of 18 or 20 miles for lime or coals, and return in the 24 hours; and this he will do four times, and even oftener, every week. It is no wonder that they carry no unnecessary fat about them.

The sheep are chiefly of the native Cheviot breed, a useful hardy sheep with a small fleece of moderate wool. A cross between a Cheviot ewe and a long-wooled ram is said to produce a useful breed improved in the carcass and in the bulk if not the fineness of the fleece. On highly improved farms the Leicester and South down breeds and almost every other may be found: but as many of the pastures are wet, and apt to cause rot in the sheep at particular seasons, most farmers buy them in to eat their turnips, and sell them off when fit for the market, before there is any fear of their being tainted.

The Cheviot sheep are described as follows. They have a fine open countenance with lively prominent eyes, a long body with a want of breadth at the chine and breast. They have fine clean legs without wool on them, and when fat their carcass will weigh from six to eight stones of 8lbs. the stone. The fleece is from 2½lbs. to 3½lbs. weight, of a mixed wool, which might probably be much improved by care in selecting the ewes and rams kept for breeding, as was done with the South-down sheep by Ellman in Sussex. Some pains have already been taken to improve the breed, and with good results. The principal farms in Northumberland are let on lease for 21 years to highly respectable tenants with sufficient capital. No more need be said to account for a high state of cultivation.

There are no very extensive old woods in the county, but many thriving plantations; there is a constant demand for small timber for the use of the coal-mines, which makes it profitable to cut young saplings, and the trees are not often permitted to acquire the size of large timber. The larch is a profitable and favourite tree in all young plantations, and thrives well in most situations, from the sides of the rivers to near the tops of the highest hills.

The following fairs are the principal in which cattle or agricultural produce is sold:—

Allentown, May 10, November 14, horned cattle; Alnwick, May 12, last Monday in July, first Tuesday in October, 28th of October, ditto; Belford, Tuesday before Whit-Sunday, August 23, black cattle, sheep and horses; Berwick, Friday in Trinity week, black cattle and horses; Billingham, Saturday after Sept. 15, horned cattle and sheep; Ellesdon, August 26, ditto; Haltwistle, May 14, November 22, horned cattle; Harbottle near Rothbury, September 9, ditto; Hexham, August 5, November 8, horned cattle, sheep, hogs; Morpeth, Wednesday, Thursday, Friday se'nnight before Whit-Sunday,—Wednesday, horned cattle;

Thursday, sheep; Friday, horses; Newcastle, August 12 and October 29, nine days each, horned cattle, sheep, hogs; North Shields, last Friday in April, first Friday in November, cattle; Ovingham, April 26, swine, fat and lean; Rothbury, Friday in Easter week, Whit-Monday, October 2, All Saints, November 1, horned cattle; St. Ninian near Fenton, July 14, hogs, September 27, black cattle and sheep; Stagshawbank, Whitsun-eve, horned cattle, horses, sheep, July 4, hogs; Tynemouth, first Tuesday in July, Warkworth near Alnwick, Old Michaelmas, if a Thursday, if not Thursday before, November 22, horned cattle; Wheelwood-bank near Wooler, Whit-Tuesday, black cattle, sheep, horses; Whittingham, August 24, black cattle, horses; Wooler, May 4, October 17, cattle, horses, sheep.

Divisions, Towns, &c.—Northumberland is divided into six wards, as follows:—

Wards, &c.	Situation.	Acres.	Pop. in 1831.
Bamborough	N.E.	69,650	10,842
Castle	S.E.	103,680	71,533
Coquetdale	Central	269,590	21,121
Glendale	N.W.	107,200	12,009
Morpeth	Central	93,530	13,312
Tindale, or Tynedale	S.W.	514,660	42,415
Newcastle, town and county of the town		2,000	42,760
Berwick-upon-Tweed		5,120	8,920
		1,165,430	222,912

It contains the assize town of Newcastle, the parliamentary and municipal borough of Morpeth, and the new parliamentary borough of Tynemouth and North Shields, and the market-towns of Allendale, Alnwick, Belford, Bellingham, Haltwhistle, Hexham, Rothbury, and Wooler. To which may be added, as places of some importance, though without markets, Alnmouth, Bamborough, Blyth, Hartley, Seaton, and Warkworth. Of these some are noticed in separate articles: ALLENDALE (pop. 5540); ALNWICK (pop. 6788); BAMBOROUGH (pop. 478); BLYTH (pop. 1769); MORPETH (pop. 3890); NEWCASTLE (pop. 42,760); TYNEMOUTH (pop. 23,206); of the rest we subjoin an account.

Belford is in the northern division of Bamborough ward, on the Edinburgh mail-road, 48½ miles from Newcastle, and 322 from London. The entire parish comprehends 9380 acres (with a population, in 1831, of 2030 inhabitants), and extends into Islandshire, a part of Durham; the township of Belford contained, in 1831, a population of 1354, about one-fourth agricultural. The town stands on a gradual slope about two miles from the sea. It consists of two principal streets; the houses are in general neat and well built. The church, or chapel, is an irregular building capable of containing 600 or 700 persons; there are two or three dissenting places of worship. There is a little weaving done; and several of the townsmen are employed in stone-quarries and coal-pits near the town. There is a market on Tuesday, at which a considerable quantity of corn is sold for exportation, and there are two small cattle-fairs in the year.

The living a perpetual curacy, of the clear yearly value of 147*l.*, with a glebe-house. There were, in 1833, in the township of Belford, five day-schools, with 181 children; three boarding-schools, with 26 children; and two Sunday-schools, with from 80 to 140 children. In the other townships of the parish were three day-schools, with 102 children, and one Sunday-school, with 42 children.

Bellingham is in north-west division of Tindale ward, 16 miles north-north-west of Hexham, and 294 from London. The parish (one of those formed by the division of Simonburn parish, A.D. 1811) comprehends the township of Bellingham, and the 'quarters' of East Charlton, West Charlton, Leemailing, the Nook, and Tarretburn, with an aggregate area of 15,540 acres, and a population, in 1831, of 1460, of whom 464 were in the town of Bellingham. The town is pleasantly situated on a declivity on the left bank of the North Tyne, and comprehended, in 1831, only 82 inhabited houses. The chapel is a small antient building with a finely groined stone roof. There are a Catholic chapel and a Burgher meeting-house. A few hands are engaged in manufacture. There is a small weekly market on Saturday; and two yearly fairs, one of them a small cattle-fair. The living is a rectory, of the clear yearly value of 194*l.*, with a glebe house. There were in the township, in 1833, two day-shools (one of them with a small endowment), with 67 children; and in the other quarters of the parish five day-schools, with 105 children.

Haltwhistle, is in the west division of Tindale ward, 285 miles from London. The parish contains 52,930 acres, and is divided into thirteen townships. The population of the whole parish, in 1831, was 4119; that of Haltwhistle township, 1018. The town is on an eminence on the northern bank of the South Tyne, and consists of one principal street, running east and west along the road from Newcastle by Hexham to Carlisle, and of some smaller streets; the streets are neither paved nor lighted. The Haltwhistle Burn, a small stream from the north, passes the east end of the town in its course to the Tyne. The houses are poor and irregularly built. At the east end of the town is an eminence, called the Castle Banks, on which are some rude fortifications of earth of unascertained origin.

The only manufacture carried on is that of baize. There are a small market on Thursday, and two yearly fairs, chiefly for cattle. There are many coal-pits in the parish, in which 100 men are employed, besides boys. The living is a vicarage, of the clear yearly value of 593*l.*, with a glebe-house. There were in Haltwhistle township, in 1833, one endowed and three other day-schools, with 183 children, and one Sunday-school, with 143 children. In the rest of the parish there were eight day-schools, with 215 children, and three Sunday-schools, with 164 chidren.

Hexham is in the south division of Tindale ward, 278½ from London. The parish comprehends Hexham township, 4310 acres, with a population, in 1831, of 4666; and Hexhamshire, 24,060 acres, with a population, in 1831, of 1376: together, 28,370 acres, population 6042. Hexham is believed to have been a Roman station. Camden conjectured that it was Axelodunum, one of the stations of the 'Notitia,' on the line of the wall (*per lineam valli*), which later antiquaries fix near Carlisle; Horsley contended for its being the Epiacum ('Επίακον) of Ptolemy, a town of the Brigantes, which others fix at Lanchester.

Two inscriptions on stones in the vaults of the antient church are considered as proofs that a Roman station did exist here. In the seventh century (A.D. 674) a monastery was founded here by St. Wilfrid, who erected the monastic buildings in a style of magnificence little known at that day. He built also three churches in Hexhamshire, which domain had been granted to him by the queen of Northumbria. A few years afterwards (about A.D. 678), on the division of the Northumbrian diocese into three parts, a bishop's see was established at Hexham, and continued for many years, until the bishops were driven out by the Danes, and the diocese was afterwards united to Lindisfarne. The abbey and town of Hexham were sacked by the Danes early in the ninth century; and in A.D. 875 it was again attacked, the church burnt, and the inhabitants massacred.

In the twelfth century the archbishop of York established here a priory of regular canons of St. Austin, and bestowed on them the former cathedral, and many other gifts (A.D. 1112). In the Scotch wars of Edward I. the town and part of the church were burnt, and the title-deeds of the priory lost; but by royal authority an inquisition was taken (A.D. 1297), and their various gifts confirmed by charter. The revenue of the priory, at the dissolution, was 138*l.* 1*s.* 9*d.* gross, or 122*l.* 11*s.* 1*d.* clear.

The town is pleasantly situated on an eminence, near the south or right bank of the Tyne, a little below the junction of the North and South Tyne. It consists of several streets, the principal of which are tolerably wide, but the rest are generally narrow; the streets are partially paved and indifferently lighted. The market-place is a spacious square, tolerably well paved, and surrounded with pretty good houses; on the south side of the market-place is a market-house, furnished with piazzas; part of it is appropriated as a butter and poultry market, and part to stalls for butchers' meat; at one end of the building is a 'pant,' or reservoir, the water to which is conveyed by pipes. In the market-place is an antient stone building, with a dial in front, formerly used as the town-hall of the bishops and priors of Hexham, and now used as a sessions-house. There are a bridge over the Tyne of nine principal arches, and three supplementary arches to allow passage to the waters in time of floods; a suspension-bridge over the South Tyne, near the town; and a bridge with two arches over a burn west of the town. On the top of the hill on which the town stands, not very far from the town-hall, is a square tower, used as a prison by the bishops of Hexham. But the most important building is the old priory church, now used as a parish church. It is a cruciform building

with a central tower, above 100 feet high to the battlements, or 125 feet high to the top of the vane. The nave, burnt by the Scots in the time of Edward I., has never been rebuilt; the transepts are separated from the choir by a screen richly carved in the lower part and adorned in the upper part by an emblematical painting. The choir is separated from its side aisles by massive clustered pillars supporting pointed arches; above these is the second tier of arches, of Norman character, separated by massive clustered columns; and above these again, a third tier of arches, pointed, supporting the wooden roof. There is a fine east window, and in the church are several antient monuments. There is an antient crypt, which some have supposed to be part of the original Saxon church built by Wilfrid. At the west end of the church are the remains of the monastic buildings; the refectory is yet entire, and is occasionally used as a room of entertainment; it is very spacious, and has an oak roof. There are some remains of the cloisters, which show the richness and excellence of their architecture. The gateway of the abbey, supposed by many to be Saxon, is also standing. There are two Catholic chapels, a Scotch church, and two or three other dissenting places of worship in the parish.

Several manufactures and branches of trade are carried on;—spinning woollen yarn, hat-making, tanning, leather-dressing, and glove-making. The market is on Tuesday for corn and provisions; and there is a Saturday market for butchers' meat. A market for cattle is held on the alternate Tuesdays during a considerable part of the year. There are two yearly markets for horses, cattle, sheep, and swine: at the earlier of these, held in August, vast quantities of lambs are sold. The Midsummer sessions for the county are held here, and petty-sessions for the ward every month. In the western part of the town is a house of correction for the county.

The living is a perpetual curacy, of the clear yearly value of 139*l.*, in the peculiar jurisdiction of the archbishop of York.

There were, in 1833, a grammar-school, with a small endowment and 65 scholars; a school, partly supported by subscription, with 230 children; seven other day-schools, with 200 scholars; and six Sunday-schools, with about 705 children.

Rothbury is in the west division of Coquetdale ward, 304 miles from London. The parish comprehends 33,170 acres, and is divided into twenty-four townships; the population in 1831 was 2869; that of the township of Rothbury, 1014. This place is delightfully situated in a retired spot on the north or left bank of the Coquet. On the north and east it is sheltered by hills; on the west, the valley in which the town stands presents a fine prospect. Rothbury consists of three streets, wide, airy, and lined with tolerably well-built houses. The market-place contains a cross. The church, which is very antient and was formerly larger than at present, is in the form of a cross. The interior is neat and spacious, and contains an antient font and several monuments. Near the church is a school-house. The river Coquet, on the south side of the town, is crossed by a stone bridge of three arches, and on the opposite side of the river is Whitton Tower, one of the antient borderers' houses, now converted into the rectory and surrounded with plantations. Rothbury is frequented in summer by invalids, who come here to drink goats' whey and enjoy the healthy and bracing air of the place.

There is a market for provisions on Friday; there are four yearly fairs, one of them a statute fair for hiring servants, and two of them cattle-fairs. The living is a rectory, of the clear yearly value of 1106*l.*, with a glebe-house. There were in 1833, in the township, an endowed grammar-school, with 65 boys; another endowed school, with 45 girls; and three other day-schools, with 65 children. In other parts of the parish there were one endowed school, with 46 children; another school, partly supported by contribution or endowment, with 25 children; and two other day-schools, with 92 children.

Wooler is in the east division of Glendale ward, 320 miles from London. The area of the parish is 4620 acres, and it had in 1831 a population of 1926. The town consists of a number of streets and lanes, with the market-place in the centre. The country round is well cultivated, but the town is ill paved and the houses are mean. The church is a neat building, erected about the middle of the last century: there are several dissenting places of worship. The market is on Thursday, chiefly for corn; there are two yearly fairs in the town; the latter, which is held in October, is a great sheep-fair. There are also a large sheep and cattle fair in September at Fenton in the parish; and a large cattle and sheep fair at Westwood bank, near the town, on Whit-Tuesday. The living is a vicarage, of the clear yearly value of 478*l.*, with a glebe-house. There were, in 1833, a grammar-school, partly supported by contributions, with 56 children; a school of industry, supported by subscription, with 32 girls; ten other day-schools, with 259 children; and five Sunday-schools, with 324 children.

There are several entrenchments and cairns near Wooler, and the thick walls of an antient tower, probably of Norman origin, and erected for the purposes of border warfare. On a hill called Humbleton Hugh, about a mile from the town, is a circular entrenchment, with a large cairn; and on the side of the hill are a number of terraces rising one above another, the origin and purpose of which have excited much conjecture. In the plain beneath this hill is a stone pillar, commemorative of the battle of Humbleton, fought A.D. 1402.

Alnemouth or Alemouth is in the parish of Lesbury, and in the south division of Bamborough ward, 313 miles from London. The area of Lesbury parish is 4540 acres; the inhabitants, in 1831, were 976, of whom 415 were in Alnemouth township. This place may be considered as the port of Alnwick: there is a considerable export of corn as well as of other agricultural produce to the metropolis, and of wool to the manufacturing districts of Yorkshire. The harbour is inconvenient, but is capable of much improvement. Some little business is done in ship-building, and a few of the inhabitants are engaged in fishing. On an eminence at the mouth of the Alne, insulated at high-water, is an old burial-ground, in which are the ruins of a chapel. Enormous bones have been dug up in or near this burial-ground, and several stone coffins have been found. Lesbury is a village between Alnwick and Alnemouth: it contains nothing remarkable. The living is a vicarage, of the clear yearly value of 269*l.*, with a glebe-house. There were, in 1833, in Alnemouth township, two day-schools (one chiefly supported by private benevolence), with 78 children, and one Sunday-school, with 50 children: and in the rest of the parish, two day-schools (one endowed), with 96 children; a sewing-school, with 15 children; and two Sunday-schools, with 114 children.

Hartley is in Earsdon parish and in Castle ward, 10 miles north-east of Newcastle. Seaton Sluice is in the township of Hartley, about a mile to the north of the town. The area of Earsdon parish is 11,060 acres: the population, in 1831, was 6460: that of Hartley township, one of eight townships into which the parish is divided, was 1850. Sir Ralph Delaval, in the time of Charles II., constructed a haven at the mouth of the Seaton Burn, which flows into the sea in this township; and in order to prevent the harbour being filled up with mud and sand, he formed a sluice, with flood-gates, to scour the haven. This haven was improved by the late Lord Delaval, who made a new entrance by a cut through the solid rock. This improvement has rendered the harbour accessible at all times and in every state of the wind: it is capable of holding twelve or fifteen vessels of 300 tons, which can ride in safety, and enter or leave the harbour fully laden. The principal trade of the place is in the coals dug from the collieries of the parish, in which nearly 500 men are employed. There is a drawbridge over the new entrance to the harbour. There are in the township three glass-houses for the manufacture of bottles, some malt-kilns, and a brewery. There are Presbyterian and Methodist meeting-houses. Nearly opposite Hartley town is a small island, called St. Mary or Bates's Island, on which formerly stood a chapel and a hermitage. There were in the township, in 1831, three day-schools, with 154 children, and one Sunday-school, with 180 children.

Warkworth is in the east division of Morpeth hundred, about 306 or 308 miles from London. The parish has an area of 16,110 acres, divided into eighteen townships: the population of Warkworth township, in 1831, was 614; that of the whole parish 2478. The town is on the south side of the river Coquet. There are a number of good houses, the place being, from the cheapness of provisions and other necessaries, considered a desirable place of residence. The church is an elegant and spacious building, part of it of considerable antiquity; the tower and spire are above 100 feet high. There are places of worship for Me-

thodists and Presbyterians. Immediately adjacent to the town is the antient castle, held at different periods by the descendants of Roger FitzRichard, and by the families of Raby and Percy, to the latter of which it still belongs. It is a noble pile, finely situated on an eminence above the river Coquet. The keep is an octagon, having a projecting tower in the middle of the four principal faces. The entrance is by a flight of steps in the tower on the south face. The whole building is very large, and comprehends many apartments. The great baronial hall is nearly 40 feet long by 24 wide, and 20 high; and there is another state-room of rather smaller dimensions. Just within the entrance, on the ground-floor, are eight apartments with vaulted roofs of stone, supposed to have been designed for the cattle which might be brought into the castle for protection against the inroads of the Scotch borderers. The masonry of the castle is in excellent preservation, but the roof, windows, and floors are for the most part gone. The outer walls of the castle are in many places entire; where they are so, they are 35 feet high. The gateway was a stately building, with apartments for many of the officers of the castle, but only a portion of it now remains. A mound of earth across the moat, which surrounds the whole and encloses an area of five acres, has taken the place of the antient drawbridge. Some other parts of the castle yet remain. The period at which this structure was built is not ascertained. The view from it is very extensive and beautiful. There is a bridge of two spacious arches over the Coquet at the north side of the town, having a tower at the south or town end, with an archway through which the road passes: in the middle of the bridge is a stone pillar, with the Percy arms carved on it. In the perpendicular rocks which form the north bank of the Coquet, about a mile above the bridge, is a hermitage, consisting of two apartments hewn out of the rock, with a lower and outward apartment of masonry, built up against the side of the rock, which rises about 20 feet high. The principal apartment, or chapel, is about 18 feet long, 7½ feet wide, and 7½ feet high, adorned with pilasters, from which spring the groins of the roof: at the east end is an altar, with a niche behind it for a crucifix; and near the altar is a cavity containing a cenotaph, with a recumbent female figure having the hands raised in the attitude of prayer. In the inner apartment are another altar and a niche for a couch. From this inner apartment was a door leading to an open gallery or cloister. Steps led up from the hermitage to the hermit's garden at the top of the bank. This hermitage, it has been supposed, was the abode of one of the Bertram family, who spent here a life of penitence for the murder of his brother: the Percy family, after his death, maintained a chantry priest here. There is no record to show the date of this foundation. There are several good shops in the town. There is a yearly fair in November for fat cattle and winter stock. There is a fishery of salmon and salmon trout (especially the latter) in the river. Warkworth is a borough by prescription: the principal officer is the boroughreeve or mayor. The parish yields excellent coal, freestone, limestone, and whinstone: valuable pebbles are sometimes found in the river. The living is a vicarage, of the clear yearly value of 528*l.*, with a glebe-house. There were in the township, in 1833, one infant-school, with 26 children; three day-schools, with 78 children; and two national schools, with 86 children in the week and 111 on Sundays.

There are some populous townships and parishes situated around Newcastle. The township of Byker, in the parish of All Saints (pop. 5176), and the township of Jesmond, in that of St. Andrew (pop. 1393), are now included in the parliamentary and municipal borough of Newcastle. The township of Cowpen, in the parochial chapelry of Horton, is near the south bank of the river Blyth, and not far from the port of that name. There is an extensive colliery in the parish, which employs about 300 men. 'Cowpen Square,' near the river, consists chiefly of houses built for the colliers. Long Benton parish, near Newcastle, has an area of 8760 acres, with a population, in 1831, of 6613. It contains the townships of Long Benton, Little Benton, Killingworth, Walker, and Weetslet. The village of Long Benton consists of one long street, in which are some good houses and a number of neat cottages. Upwards of 1200 men are employed in the collieries of this parish, and about 40 or 50 in iron-founding. In the township of Walker are manufactories of bricks and tiles, and of copperas. There were, in 1833, one boarding-school, with about 20 boys; nine day-schools, with about 387 children; and five Sunday-schools, with about 250 children. The parish of Wall's End, between Newcastle and Tynemouth, has an area of 2560 acres, with a population, in 1831, of 5510; it comprehends the townships of Wall's End, Howdon Pans, and Willington. The village of Wall's End is large and well built, with a spacious green in the centre; the parish church is a neat modern building. There are several places of worship in the parish for Methodists and Presbyterians. There are extensive collieries, in which upwards of 900 men are employed. At Howdon (or Howden) Pans (so called from the numerous salt-pans, now discontinued), are large docks, in which frigates and Indiamen were formerly built, but now only colliers. There is a covered ropewalk connected with the docks; and at East Howdon, close by, is a manufactory for coal-tar, varnish, and lampblack. There are staiths along the river, from which a great quantity of coal is shipped for London. There are also in the parish extensive lime-kilns and manufactories for copperas and earthenware. The parish of Wall's End takes its name from the Roman wall ending here on the north bank of the Tyne. There were, in 1833, sixteen day-schools, with about 551 children; a national-school, with about 180 children in the week and 200 on Sundays; and five Sunday-schools, with 490 children.

Ford is near the Scottish border, on the right bank of the Till, about 9 miles from Wooler. The parish comprehends an area of 12,220 acres, and had, in 1831, a population of 2110. The village consists of one irregular street, on an eminence rising from the river, over which is a bridge. Ford Castle is on the north side of the village and was originally built in the reign of Henry III., by Sir William Heron, and was in great part rebuilt by the late Lord Delaval. Of the original structure only two towers on each flank of the present edifice remain. The castle commands a fine prospect up the valley of the Till as far as Wooler. It was antiently a border fortress of importance, and suffered severely from the Scots in an incursion in the year 1385: it was taken by James IV. A.D. 1513, just before the battle of Flodden (which was fought in this parish), and was again captured, with the exception of one tower, which held out, in 1549. Besides the parish church, there are two dissenting places of worship. Nearly 200 men are employed in the parish in the coal-pits and stone quarries. There were, in 1833, six day-schools, with 197 children; one day and Sunday school, with 60 children in the week and 26 on Sunday; and one Sunday-school, with 15 children.

Corbridge is in the east division of Tindale ward. The parish has an area of 13,130 acres, with a population, in 1831, of 2091, of which 1292 were in the township of Corbridge. This large and populous village is on the north bank of the Tyne, over which there is a bridge of seven arches. It consists of a main street, along the road from Newcastle to Hexham, and several smaller streets. There is a spacious market-place, which formerly contained a cross. The parish church is a very antient structure, of larger dimensions formerly than at present; and at the north-east corner of the market-place is an antient tower, formerly used as a prison, and now as a lock up house. Corbridge was formerly a place of importance and a market-town. It had four parish churches, three of them now demolished. There are traces of extensive buildings between this place and the neighbouring Roman station of Corchester. This town suffered much from the Scots, A.D. 1296 and 1311. At Stagshawbank, 2½ miles north-east of Corbridge, one of the largest sheep-fairs in the north of England is held. The living of Corbridge is a vicarage, united with the chapelry of Halton, of the clear yearly value of 482*l.*, with a glebe-house. There was in 1833 a national-school in the township, with 61 children; and in other parts of the parish there were two day-schools, with 62 children, and one Sunday-school, with 40 children.

Divisions for Ecclesiastical and Legal Purposes.—The whole county of Northumberland is included in the diocese of Durham; the district of Hexhamshire, which was till lately in the peculiar jurisdiction of the archbishop of York, has been by an order in council added to the diocese of Durham. The whole county, with the detached portions of Durham, constitutes the archdeaconry of Northumberland; and is subdivided into the five rural deaneries of Newcastle (21 benefices), Corbridge (20 benefices), Bamborough or Bamburgh (17 benefices), Alnwick (20 benefices), and Morpeth (19 benefices): making the total number of

benefices, in the year 1811 (when the *Historical and Descriptive View of Northumberland,* from which we take these numbers, was published), 97. The number of benefices in Hexhamshire is 7; these are included in the number assigned above to the deanery of Newcastle, to which that district has been added.

The Dissenters of Northumberland are chiefly Presbyterians, and the Presbyterian form of church government exists among them in greater completeness than is usual in England. There were, in 1811, in the county of Northumberland, in the detached portions of Durham, and in the town of Berwick-upon-Tweed, 44 Presbyterian congregations, viz. 27 in connection with the kirk of Scotland; 11 in connection with the Scotch Seceders (viz. 5 Burghers, 4 Antiburghers, 2 of the 'Relief'); and 6 others not connected with any Presbyterian body. There were at the same time 5 Independent and 2 Baptist congregations, with a few scattered Baptist societies which met for worship but had no stated ministers. There were also 22 Catholic chapels, 11 of them attached to the residences of the Catholic gentry or supported by them. It is probable that during the last few years the number both of Catholic and Dissenting places of worship has been materially augmented.

The county is in the northern circuit. The assizes are held at Newcastle, to which the judges proceed from Durham. The quarter-sessions are held at Newcastle (Epiphany), Morpeth (Easter), Hexham (Midsummer), Alnwick and Berwick (Michaelmas). The county gaol and house of correction is at Morpeth; there are other houses of correction at Tynemouth, Hexham, and Alnwick. The number of persons committed to these various places of confinement was as follows:—

	Year ending October, 1834.	1835.	1836.
Morpeth	191	194	136
Tynemouth	107	89	161
Hexham	56	53	78
Alnwick	105	91	69
	459	427	444

There is a common gaol at Newcastle-upon-Tyne for the county of the town of Newcastle; to which the committals were as follows:—1834, 477; 1835, 415; 1836, 539. The county gaol, the Hexham house of correction, and the Newcastle gaol, are for debtors as well as criminals; and on the average nearly half the committals to Newcastle gaol are for debt.

Before the Reform Act, only six members of parliament were returned from Northumberland, viz. two knights of the shire, who were elected at Alnwick, and two members each for the boroughs of Newcastle and Morpeth. By the Reform Act the county was formed into two divisions, each returning two members. The northern division consists of Glendale, Bamborough, and Coquetdale wards; with Norhamshire, Islandshire, and Bedlingtonshire, parts of the the county of Durham; and Berwick bounds; all which are, for parliamentary purposes, annexed to Northumberland. The court of election for this division is held at Alnwick; and the polling-stations are Alnwick, Berwick, Wooler, Elsdon, and Morpeth. The southern division comprehends Tindale (or Tynedale) and Castle wards, and the county of the town of Newcastle. The court of election for this division is held at Hexham; and the polling-stations are Hexham, Newcastle-upon-Tyne, Haltwhistle, Bellingham, and Stamfordham. By the Reform Act, Morpeth was reduced to one member, but the new borough of Tynemouth was created, returning one member, so that the number of borough members remained as before. The boundaries both of Newcastle and Morpeth were extended; and Tynemouth was declared to include the townships of Tynemouth, North Shields, Chirton, Preston, and Cullercoats.

Berwick-upon-Tweed returned two members before and after the Reform Act; the townships of Tweedmouth and Spital were added by the Boundary Act.

History, Antiquities, &c.—In the earliest period of the history of the island the eastern side of the county and the adjacent parts of Scotland were inhabited by the Otadeni ('Ωταδηνοι, Ptol.), whose towns were Curia (Κουρία, Ptol.) and Breminium (Βρεμένιον), the latter of which was in Northumberland. On the west of the Otadeni, in Northumberland, Cumberland, and Galloway, were the Gadeni (Γαδηνοι, Ptol.), none of whose towns are mentioned by Ptolemy. The Alaunus ('Αλαυνος) of Ptolemy, which has been identified with the Tweed (Horsley) and the Coquet (*Maps of the Society for the Diffusion of Useful Knowledge*) should rather be identified with the Alne; at least if the name may be taken as a guide. The Alauna of Richard of Cirencester (Iter IV.) is evidently the same as the Alaunus of Ptolemy; and the Tueda of Richard (Iter IV.) may be safely identified with the Tweed.

There are several remains of the primitive inhabitants of the country, consisting chiefly of rude hill-forts, cairns, and Druidical monuments. In Armstrong's map of the county the forts are marked as being very numerous, especially amid the hills of the border toward Scotland. To what historical period they are to be referred is doubtful. Some may be memorials of a period anterior to the Roman conquest under Agricola; others may be referred to the struggles of the inhabitants or northern Britons with the Romans under Severus and his successors; and others to the subsequent struggle against the Northumbrian Angles.

Of these British remains, one of the most remarkable is on Yevering Bell, near Wooler, where the nearly level summit of an oblong mountain, which rises 2000 feet above the adjacent plain, is encircled with the remains of a wall built of large flat whinstones without mortar, and enclosing a considerable area. The medium breadth of the ruined wall is eight feet. There is an entrance on the south side. There is an inner enclosure, formed of stones, with a ditch inside; and this inner enclosure contains a large cairn of stones. On the sides of the hill are the remains of circular buildings; but so far ruined and the stones so scattered, as to render it impossible to ascertain their former use. There are also the traces of a grove of oaks. It has been conjectured that it was a Druidical temple.

On a hill called Humbleton Hugh, near Wooler, is an antient entrenchment, with a huge cairn. The slope of the hill consists of terraces rising one above another; these terraces are commonly supposed to be artificial, and various conjectures have been formed as to their origin and use. They are observed on the face of other hills in the neighbouring districts and also in Scotland, and are usually surmounted by hill-forts. Possibly they owe their origin to the disintegration of the strata of the rocks of which the country is composed. There is a somewhat similar fort at Cornhill near the Tweed.

Between the village of Ilderton in Coquetdale ward and Hedgehope, one of the border hills, is a Druidical monument consisting of ten large rude and unequal stones, arranged so as enclose an oval area of thirty-eight yards from east to west by thirty-three from north to south. The stones are mostly thrown down and partly buried in the earth. It is probable they were originally more numerous.

Of other forts or camps may be mentioned those at Spindleston near Bamborough; that near Alnham, by the head of the Aln; those on Bewick Hill and at Harup Burn between Alnwick and Wooler; that at Old Rothbury near the modern town of the same name; those near Craghead in Rothbury Forest, Motehill, Elsdon (where Roman inscriptions have been dug up), between Bellingham and Rothbury; and a camp near Belford, nearly square, which has usually been ascribed to the Danes.

The Romans do not appear to have attacked this part of the country until the time of Agricola, who was sent over to Britain, about A.D. 78, as governor. [AGRICOLA.] His predecessors had subdued or nearly subdued the Brigantes, whose territory probably extended to the Tyne. It appears to have been in the second year of his command (Tacit., *Agric. Vita*, c. xx.) that he formed that line of forts which extended from the German Ocean to the Solway Frith, and nearly coincided with the line of the great wall subsequently erected. Of the subjugation of the Otadeni and Gadeni by him we have no distinct account. They were perhaps brought into subjection during the second year of his command, or were among the nations whose country he ravaged in his third campaign, when he advanced into Scotland as far as the Tay. He secured his conquests by a second line of forts extending from the Forth to the Clyde.

The northern conquests of the Romans were by no means permanent. Agricola was recalled, and the Roman power languished. The Caledonians continued hostilities, and several tribes, who had submitted, revolted (Spartian., *Vita Hadriani*); and the emperor Hadrian found it expedient to abandon all the country between the two lines of forts built by Agricola, and to defend the southern part of the island by a rampart of earth. Hutton (*Hist. of the Roman*

Wall) considers that Agricola had carried a ditch and bank across the island, and that Hadrian repaired this and strengthened it by new defences. Perhaps some posts were maintained by this emperor beyond the line of the wall. In the reign of Antoninus Pius, the district between the two lines of forts formed by Agricola was reconquered by Lollius Urbicus, lieutenant of the emperor, who raised a rampart of turf (murus cespititius) across the island in the direction of the northern line. Hostilities between the Romans and the yet unsubdued natives were renewed under Marcus Aurelius, the successor of Pius, but the historians of the period give us no particulars. In the following reigns Northumberland and the rest of the country between the two walls appear to have regained their independence: the tribes who inhabited them seem to have united into one body, called by the Romans Mæatæ (Μαιᾶται), a name which is supposed to be derived from the British word 'meath,' denoting a plain. Severus was engaged in active warfare against these natives (A.D. 207-210): he lost 50,000 men, but ultimately obliged them to submit. He carried a strong wall (murus) across the island nearly in the line of Hadrian's rampart. Hostilities were soon renewed by the natives, and Severus died at York in the midst of his preparations to extirpate them (A.D. 210 or 211). Caracalla, his successor, hastily made peace with the natives; and it is likely that the independence of the country north of the wall was tacitly admitted if not recognised, though some fortified posts were probably retained by the Romans. The subsequent history of the county during the Roman period is obscure: it was probably the seat of hostilities under Constantine and Valentinian (Ammianus Marcellin., lib. xxvi. 4; xxvii. 8), under the latter of whom, Theodosius, a Roman general, recovered this and the adjacent districts, to which the name Valentia was given. When the Roman power in Britain was vigorously wielded, this province appears to have been subject to the Romans; when the administration was feeble, the natives resumed independence and perhaps active hostility.

The most remarkable monument of the Roman dominion is the great line of defence formed and augmented by the successive labours of Agricola, Hadrian, and Severus; and sometimes called 'the Picts' Wall,' sometimes 'the Roman Wall.' Some account of these great works has been given elsewhere. [BRITANNIA, vol. v., pp. 444, 445.] We have here only to notice in connection with them the position and traces of the stations along their line (*per lineam valli*) which are in Northumberland.

The first station, Segedunum, is generally fixed at Cousen's house, Wall's End, between Newcastle and Tynemouth: there are no remains. Pons Ælii, the second station, was, in the opinion of most antiquaries, at Newcastle; but Camden was induced by the name to fix it at Ponteland, which is north of the wall, on the Pont, one of the branches of the Blythe, 7¼ miles north-west of Newcastle. Condercum, the third station, is fixed at Benwell Hill, an eminence 2 miles or 2½ miles from Newcastle; there are very distinct traces of this station above the village of Benwell. Vindobala, the fourth station, is fixed at Rutchester, or Rouchester: the ramparts of this station, which was large, are very visible. The station is situated just on the line of the wall; and that part of the station which lay beyond the wall to the north was strengthened by several towers. Some slight portions of the masonry remain. A great number of coins and other antiquities have been dug up near this station. The fifth station, Hunnum, was at Halton Chesters: it was between Hadrian's rampart and the wall of Severus. Coins, inscriptions, urns, and other antiquities have been discovered here. Cilurnum, the next station, was at Walwick Chesters, close on the right or west bank of the North Tyne. Its area is rather above the usual extent of the stations, being about eight acres. The ground within the vallum is crowded with the ruins of stone buildings, which formed apparently two streets from east to west, and a third cross street from north to south. This station is just on the line of the wall of Severus, having Hadrian's rampart on the south side of it. Procolitia, the seventh station, was on an open elevated spot at Carraw-burgh. A great part of the rampart is very entire, and the wall of Severus, which forms the north side, is in good preservation. About half a mile south-west of this station is a square fort called Brown Dykes or Broom Dykes, which appears to be of Roman origin. There was also a station at Shewing Shields, a little to the west of Procolitia. Horsley conjectures that it belonged to Hadrian's line of defence, but became useless when the wall of Severus was built. Borcovicus, the eighth station, is fixed at House Steads, 6 or 7 miles north-east of Haltwhistle. This is the most perfect and the grandest station on the whole line. It is on an elevation, with a steep or precipitous descent toward the north, and a gentler declivity toward the south: it comprehended fifteen acres, and had a large suburb on the south side. As many as twenty streets may be counted. A great number of altars, inscriptions, and other antiquities have been discovered here. There was a temple of Doric architecture; and part of a Doric capital and fragments of the shafts of columns have been discovered: a Roman altar, the inscription of which is perfect, now decorates the fireplace or mantel of a neighbouring farm-house. Between the two last-mentioned stations, Procolitia and Borcovicus, the works of Agricola and Hadrian and those of Severus separate, the former being carried along the lower ground, while the wall is carried over crags and precipices, and, from the deep declivity on the north, needs no ditch. There are one or two gaps in the craggy ridge, over which the wall is carried, by which gaps the Picts, and after them the moss-troopers of the border, frequently broke in. Vindolana, the ninth station, is generally placed at Little Chesters. The ramparts of this station are visible, but the ditch is nearly filled up: it lies a mile if not two miles south of the wall. The prætorium may be distinguished; and several antiquities have been discovered here. Æsica, the tenth station, is at Great Chesters: the trenches and ramparts are well preserved, and the prætorium is visible: there are the ruins of several buildings. Several remains of the south entrance of the station, part of the jambs, and pieces of an iron gate and hinges were found here; and a variety of broken altars and effigies have been discovered. Magna, or perhaps Magnæ, the eleventh station, is fixed at Carvoran, close to the border of the county toward Cumberland. It is a small station, and lies to the south of both the rampart of Hadrian and the wall of Severus. It is on low ground in a valley watered by two little rivers, the Tippal, which falls into the Tyne, and the Irthing, which flows into the Eden. Many antiquities have been dug up. The military roads which accompanied the course of the wall may be traced in several places. The modern turnpike-road runs in some parts on the foundation of the wall of Severus.

Beside the stations on the line of the wall, there were some other places of note in this county in the time of the Romans. The Bremenium of Ptolemy, noticed in the first *Iter* of Antoninus under the slightly varied name of Bremenium, has been fixed by Camden, Horsley, and other antiquaries, at Riechester, or Rochester, on the Reed, which falls into the North Tyne. Reynolds (*Iter Britanniarum*) contends for Newcastle, but with more zeal than success. This station appears to have been of great strength and importance, being defended by a wall of ashler-work seven feet thick, three ramparts of earth, and moats, and was probably maintained as an outpost beyond the wall. Several altars, inscriptions, coins, and other antiquities have been found here. A station, to which, on the faith of an inscription found there, the name of Habitancum is given, was fixed at Risingham, where are the remains of a small fort. A great Roman road, to which the name of the Northern Watling Street was applied, entered this county from Durham, and passing Corstopitum, near Corbridge, divided into two branches, one of which ran by Habitancum and Bremenium into Scotland, while the other ran to the west of Morpeth and Alnwick into Scotland near Berwick. At Corstopitum, or Corstoplium, now Colchester, or Corchester, near Corbridge, a Roman town or station, almost entirely levelled, many antiquities have been discovered. Some antiquaries have fixed the Curia (Κουρία) of Ptolemy, one of the towns of the Otadeni, here. Just before entering Scotland, the western branch of Watling Street passed a camp at Chew Green, near the head of the Coquet, supposed to be 'Ad Fines,' a station in the fifth *Iter* of Richard of Cirencester. This is a very remarkable camp, with numerous ramparts and ditches in excellent preservation. A Roman road, called 'the Maiden Way,' entered the county from near Aldstone in Cumberland, and ran north to the station Magna on the wall.

Beside these stations and places to which a name may be assigned, there are other places in which Roman antiquities have been discovered. Hexham has been noticed already. Whitley Castle, on the Maiden Way, just on the border of Cumberland, is a Roman camp, fortified with many trenches

and breastworks of earth. At Old-town in Allendale are the traces of another camp or station, and many antiquities have been discovered. There are camps at Outchester, or Ulchester, near Bamborough, at Shieldikes in Rothbury Forest, and in other places. Altars, inscriptions, or other antiquities have been dug up or found at Elsdon in Redesdale (the Valley of the Reed), Simonsburn, near the North Tyne, just without the wall, at Tynemouth, and other places. Indeed, in the number of Roman inscriptions and sculptures discovered in it, Northumberland very far surpasses any other English county.

Upon the departure of the Romans in the fifth century, Northumberland became the prey of the Picts and other barbarians, who broke through the wall and ravaged the island. When the Saxons were invited to oppose these invaders, a body of them, under Octa and Ebusa, were posted with their ships at the east end of the Roman wall (perhaps A.D. 454); but it was not till near a century afterwards (A.D. 547) that a serious attempt was made at the permanent conquest of this part of the country. A considerable part of the country between the Humber and the Forth was divided into the two states of Bryneich and Deifyr; and it is probable that Northumberland was included in Bryneich, the northernmost of these. Perhaps some portions of the county may have been included in the district of Gododin, of which the bard Aneurin was chief, or in that of Reged, which was governed by Urien, the patron of the bard Taliesin. The invaders were Angles, and their leader, Ida, though he experienced a stout resistance from the natives, especially from Urien, laid the foundations of an Anglo-Saxon kingdom in Bryneich, or Bernicia. He built a castle on the coast, to which he gave the name of Bebban Burgh, since better known as Bamborough; or perhaps he seized on a Roman fort, and added to it some further defences of his own. Ida died A.D. 560. The reigns of his immediate successors were brief, and not marked by any particular events; but the power of the invaders gradually extended. One of their chieftains, named Ella, separating himself from the other Angles of Bryneich, founded the kingdom of Deifyr, or Deira, separated from Bryneich by a vast forest that occupied what is now the county of Durham; and other warriors, penetrating to the southward, established the state of Mercia, the latest founded of the Anglo-Saxon kingdoms; first a dependency of Deifyr, but at length an independent state, and the powerful competitor of Wessex for the supreme dominion of Britain. The two kingdoms of Bryneich and Deifyr were frequently united, and, when so united, constituted the great kingdom of Northumbria (we appropriate this form of the name to the kingdom, Northumberland to the county), of the history of which we shall give a sketch here. This kingdom extended along the eastern shore of the island from the Humber to the Forth, thus including a considerable portion of the lowlands of Scotland. It was bounded on the west by the British kingdoms of Strathclyde, or Vale of Clyde, and Cumbria, which extended south to Lancashire. The boundary of the Northern Angles and Cumbrian and Strathclyde Britons is not clearly ascertained, and probably varied much with the changing fortunes of the parties. The superiority of the invaders was however gradually but firmly established.

Ethelfrith or Ædelfrid, grandson of Ida, distinguished himself by his vigorous attacks on the Britons. He carried his arms into their territories, gained a great victory near Chester, and massacred the monks of Banchor, or Bangor, on the Dee in Flintshire (who had accompanied the British host into the field), and demolished their monastery. These transactions are variously dated A.D. 602 to 612 or 613. Ethelfrith was defeated and slain (A.D. 617) by Redwald of East Anglia [NORFOLK], and succeded by Edwin, of the race of Ella of Deifyr, whose history is given elsewhere. [EDWIN.]

On the death of Edwin (A.D. 633), under whom the two Northumbrian kingdoms were united, his dominions were ravaged by the combined Mercians and Britons. Osric, a kinsman of Edwin, who succeeded to the crown of Deira, or Deifyr, and Eanfrid, son of Ethelfrid, who succeeded to Bernicia, or Bryneich, restored paganism, which Edwin had renounced: they were both speedily slain by Cadwallon, or Cadwallader, the Briton, who seized both the Northumbrian kingdoms, but was himself defeated and slain by Oswald, another son of Ethelfrith (A.D. 634 or 635), in the neighbourhood of Hexham, perhaps at St. Oswald's, in the line of the Roman wall. Oswald succeeded to both the kingdoms of the north; and did much for the promotion of Christianity, which Edwin had introduced. He was recognised as Bretwalda of Britain, and his supremacy was acknowledged by what Bede calls the four tongues of Britain, the Angles, Britons, Picts, and Scots. He fell in battle against Penda the Mercian at Maserfelth, probably at or near Oswestry in Shropshire (A.D. 642). The place where he fell attests the extent of his dominions, for he was not the invader, but the invaded party. Penda, flushed with success, overran Northumbria; but Bebbanburgh resisted his attacks, and the steps which he took to burn it led to his repulse. Oswy, or Oswio, brother of Oswald, was then chosen successor to the Northumbrian crown in Bernicia, and Oswin, son of that Osric whom Cadwallon had slain, in Deira.

Oswio became more powerful than any of the sovereigns who had yet reigned over Northumbria. He subdued the greater part of the Picts and Scots, attacked Deira, and, on the death of Osric, who was killed by treachery (A.D. 651), obtained part of that country, leaving the rest to his nephew Ethelwald, the son of Oswald; and, having defeated and slain the warlike Penda (A.D. 655), possessed himself of Mercia, part of which he granted to Peada, son of Penda. The Mercians however soon revolted, and raised Wulfhere, another son of Penda, to the throne. But Oswio remained the most powerful of the Anglo-Saxon princes: he enjoyed the dignity of Bretwalda, and was addressed by Pope Vitalian as 'Rex Saxonum.' The archbishopric of York was coextensive with the dominions of Oswio, and comprehended the territory of the Picts. He died (A.D. 670), after a reign of twenty-eight years, and was succeeded by his son Egfrid.

Upon the accession of Egfrid the Picts attempted to regain their independence, but were defeated with great slaughter. He wrested Lindesey (a part of Lincolnshire) from Wulfhere; and divided his kingdom, thus enlarged, into three dioceses: Bernicia, the see of which was at Hexham, afterwards at Lindisfarne; Deira, see at York; Lindesey, see at Sidnaceaster or Sidnacestre. Subsequently a bishop of the Pictish provinces was appointed. Alfwin, brother of Egfrid, reigned in some part of Northumbria, in subordination, it is likely, to the supremacy of Egfrid. Egfrid sent an army to Ireland, and conquered several portions of territory from the Cumbrian Britons (A.D. 684 and 685). He fell at last in battle against the Picts, whose country he had invaded (A.D. 685), and was succeeded by his brother Aldfrid, or Ealdferth, who reigned nineteen years (A.D. 685-705). He was a religious and learned prince. After him came Osrid his son, who reigned eleven years (A.D. 705-716), and died in battle, probably against the Picts, with whom both Aldfrid and Osrid had carried on hostilities. According to another account Osrid fell by assassination by the hands of Coenred, or Cenred, who succeeded him and reigned two years (A.D. 716-718), and of Osric, who succeeded Cenred, and reigned eleven years (A.D. 718-729). Ceolwulf succeeded his brother Cenred. In his reign Ethelbald of Mercia invaded and ravaged Northumbria, carrying off with him great booty. Ceolwulf was a weak prince, and the misfortunes of his reign led to treasonable plots, which induced him to abdicate the throne. Eadbert succeeded (A.D. 737), and, in a vigorous reign of twenty-one years, subdued all the neighbouring kings, Angles, Picts, Britons, and Scots. In alliance with the Picts he took Alcluid, or Dumbarton, a fortress of Strathclyde. Pepin, king of the Franks, sought his friendship. He resigned his crown (A.D. 758), and retired to a monastery. A long list of princes, whose short reigns were marked by bloodshed and treason, succeeded to the throne. The annals of Northumbria are a mere chronicle of murders, battles, revolts, and depositions, till the accession of Eanred (A.D. 809). The limited power or unambitious disposition of this prince induced him to submit without resistance to Egbert, who acquired for Wessex the permanent supremacy of the Anglo-Saxon kingdoms.

In the year 844 the Danes attacked Northumbria, and slew Redwulf, who had usurped the throne, and Alfred, who was probably coadjutor of Redwulf in the government. In 867 Northumbria was again assailed by a vast armament of these invaders, under Ingwar, or Ivar, Halfdane, and Hubba, sons of Regnar Lodbrog, who are said to have come in order to revenge the death of their father, who had perished in Britain, and most likely in Northumbria. The government of that kingdom was at that time contested by

Osbert and Ella, who, on the approach of the Danes, made peace with each other, and divided the kingdom between them. They both fell in an attempt to recover York, which the Danes had taken. That part of Northumbria which was north of the Tyne was bestowed by the invaders upon Egbert, but he was expelled by the Northumbrians, and succeeded by Ricsig, after whom came another Egbert. In this period the Danes made an entire conquest of the country, and settled in it. Halfdane became sovereign, and divided the kingdom among his followers.

It is difficult to trace the causes which led to so complete a subjugation of the north of England by these invaders. Perhaps the strength of the Northumbrian kingdom had been consumed in the domestic strife of so many years, or the dissensions which had prevailed made each party prefer the dominion of strangers to that of their rivals. It may be, too, that the ferocity engendered by a long period of anarchy had prepared the population for readier coalition with those to whose habits their own had become assimilated. However this may have been, the conquest was complete; and in the treaty which Alfred made with the invaders, Northumbria was included in the Danelagh, or Danish territory. On the death of Halfdane (A.D. 883) Guthred and Ecgbert succeeded respectively to the crowns of Deira and Bernicia, to which latter kingdom the name of Northumbria began about this time to be restricted, though we shall still use it in its more extended application.

The territory between the Tyne and the Tees was bestowed on St. Cuthbert (who had appeared in vision to Eadred, then bishop of Lindisfarne), and became thus the portion of the bishops of Durham, and the foundation of their palatinate jurisdiction. On the death of Guthred, who, though of Danish birth and lineage, appears to have embraced Christianity, the Northumbrians, Danes as well as English, appear to have submitted to Alfred. Eric, or Eohric, is recorded as the leader of those who remained pagans; but he recognised the supremacy of the West Saxon kings.

Against the successors of Alfred the Northumbrian Danes continually renewed the struggle, but always with ill success. On the accession of Edward the Elder (A.D. 901), Eric and his followers supported his competitor Ethelwald; but both Ethelwald and Eric fell in battle, and Northumbria submitted to Edward. A new invasion or insurrection of the Northmen, under Regnald, Sihtric, and Niel, or Nigel (the last two being sons of Ingwar, or Ivar), followed; and as far as we can gather from Simon of Durham, they defeated, near Corbridge, a confederate army of Scots and native Northumbrians, and seized the whole kingdom, but were compelled to acknowledge the supremacy of Edward the Elder. Nigel was killed by his own brother Sihtric before the submission of the Danes to Edward.

Sihtric married the sister of Athelstan (about A.D. 925), who had succeeded to the throne and supremacy of his father, Edward the Elder: he consented to embrace Christianity, and governed Bernicia as subordinate to him. On Sihtric's death (A.D. 926) his son and successor Guthferth, or Godefrid, endeavoured to throw off his subjection to Athelstan, by whom he was defeated and expelled (A.D. 927). Regnald governed at this time a portion of Northumbria, and one Eric obtained another considerable portion, perhaps of the dominions of the expelled Guthferth, as vassal of Athelstan, on condition of embracing Christianity and defending the dominions entrusted to him against Scots and pagan Danes.

The rising power of Athelstan, and his inveterate hostility to Guthferth, whom he compelled the king of Scotland to dismiss, provoked a general confederacy against him. He is said to have added Northumbria to his dominions, at least to have exercised a sovereignty which had not been previously claimed. Anlaf, Aulaf, or Olave, son of Guthferth, and 'king of Ireland and the Isles,' arrived in the Humber with a mighty fleet, increased by piratical adventurers from Norway and the Baltic, and accompanied by Constantine of Scotland. The Northumbrian Danes rose in favour of Aulaf, and perhaps those of East Anglia; and the Britons of Cumbria and Wales joined in the attempt to overthrow the supremacy of Athelstan, who, at this crisis, augmented his own forces by mercenary troops and auxiliaries from Rollo of Normandie. [NORMANDIE.] The contending parties met at Brunanburh, or Brunnaburgh, probably in Northumbria (A.D. 937): the victory of Athelstan was decisive, and was commemorated in the Sagas of the north and the songs and chronicles of England. Aulaf fled, and Northumbria was incorporated in the dominions of Athelstan.

On the death of Athelstan and the accession of his brother Edmund I. (A.D. 941), Aulaf possessed himself of Northumbria and a part of Mercia. He defeated Edmund at Tamworth and Leicester, and obtained the cession of all England north of Watling Street (A.D. 943). This was the utmost extent of the Danelagh, as arranged by Alfred. The sovereignty of Aulaf seems moreover to have been independent of the West Saxon crown; and it was agreed that whichever of the two princes survived, the other should succeed to the whole. Aulaf died soon after; and Edmund seized Northumbria, driving out Aulaf II., son of Sihtric and uncle to the late Aulaf, and Regnald, son of Guthferth and brother of Aulaf I. He also conquered the Cumbrian Britons, and gave their territories to the king of Scotland on condition of securing the north against invaders.

On the accession of Edred, brother of Edmund (A.D. 947), the Northumbrians renewed their homage to the West Saxon, or, as we may now call it, the English crown; but within a year or two violated their engagements, and made a final effort for independence. Eric, whom Athelstan had set over part of Northumbria, but who had forsaken his government and turned pirate, was chosen king by them: he was however unable to retain his kingdom. Edred ravaged Northumbria (A.D. 949, 950), and the Northumbrians abandoned Eric, who was slain by treachery. The kingdom of Northumbria was now extinguished, and the regions which composed it were divided into earldoms or counties, of which Bernicia, or Northumbria north of the Tyne, was one, Deira (Yorkshire) another, and Lothian (south of Scotland) a third. It is probable that Bernicia was nearly conterminous with the present county; to this therefore, under the name of Northumberland, the rest of our notice will be confined. It may be as well to mention that Lothian was ceded (about A.D. 971) to the kings of Scotland, in feudal subjection to the English crown.

In the wars of Ethelred II. with the Danes, Bebbanburgh was stormed (A.D. 993); and some years after (A.D. 1013) the north of England passed with little resistance into the power of Sweyn, by whom it was held till his death. Canute, son of Sweyn, soon repossessed himself of it, and held it until, on the death of Edmund II., all England became subject to him. During this period the earldom of Northumberland was held by Oswulf and his descendants, Eadulf, Etheldred, or Aldred, Waltheof I., and Uchtred, the last of whom deserted from Ethelred to Canute, by whose order he was slain (A.D. 1016). His death was avenged by his son Aldred II., who slew Thorbrand, Canute's instrument in the murder; but was himself slain by Charles, son of Thorbrand. He was succeeded in his earldom by his brother Eadulf, who defeated the Britons of Strathclyde, but was killed by Siward, who became earl of Northumberland in his room.

These transactions show the anarchical state of Northumberland, the result of that practical independence which its remoteness from the seat of the supreme government secured to it. Siward held the earldom of York as well as of Northumberland (A.D. 1042-1055), and ruled with vigour and success. He formed one of the band of nobles who counterbalanced, during the reign of Edward the Confessor, the power of Earl Goodwin, or Godwin, and his family; and the share he took in the restoration of Malcolm III. Canmore to the throne of Scotland has been made generally known in the 'Macbeth' of Shakspere. On the death of Siward, his earldoms were granted to Tostig, brother of Harold, afterwards king; but his northern subjects rejected him and chose Morcar, or Morkar, son of Algar, earl of Chester, in his room (A.D. 1065). Morcar granted the earldom of Northumberland to Osulf, a descendant of the former earls, but in subordination to himself.

On the Conquest (A.D. 1066), William imprisoned Morkar and deposed Osulf from his earldom, which he conferred on Copsi, an adherent of Tostig. Osulf on this assassinated Copsi, but was himself killed by a robber soon after. The earldom was subsequently possessed by Robert Comyn, a Norman or other foreign companion of William, who was killed in a rising of the people at Durham; by Cospatric, a Saxon, whom William afterwards expelled from the earldom; by Waltheof, son of Siward, another Saxon, executed as a traitor at Winchester; by Walcher, bishop of Durham,

a Norman, murdered in a tumult at Gateshead; by Alberic, a Norman; and by Robert de Moubray, a Norman. In the stout resistance offered by the men of the north of England to the Norman power, and in the fearful vengeance by which that resistance was punished, few events can be connected with the county of Northumberland, except the removal of the body of St. Cuthbert from Durham to Lindisfarne, or Holy Island. It is probable that the county was then thinly peopled and little cultivated. Its great sources of wealth, its mineral treasures, required a more peaceful time and a more advanced civilization to develop them. It may be supposed that the dissension and anarchy which had for two or three centuries pervaded the north, and the infusion of the manners of the barbarous Northmen, had thrown back the population in the scale of social improvement, or at least retarded their advance. When William (A.D. 1068 or 1069) had wasted and depopulated the more densely inhabited tract between York and Durham, he seems to have disregarded the country beyond the Tyne. We do not find that he penetrated into it, except in his way to invade Scotland (A.D. 1072), and in his return. The county, as well as Cumberland, Durham, and Westmoreland, is omitted in 'Domesday Book.' About this time it was exposed to the ravages of the Scots, who are said to have carried off so many of the inhabitants, that there was scarcely a house in Scotland without one or more English slaves.

As the Scottish princes augmented their territories and consolidated their power, and as the Anglo-Norman princes on the other hand grew in wealth and resources, Northumberland became subject to the evils and received the constitution of a border county. The earldom became merely titular, and the government of the county was given to the high-sheriff, who was entrusted with unusual powers. The county was subdivided into baronies, which were arranged in six wards and subdivided into constableries. Excursions for plunder became the occupation of the borderers on both sides of the frontier, and they alternately inflicted and endured the miseries of petty but uninterrupted warfare. Agriculture in so insecure a state was neglected, and the cattle became the chief property of the landowner. Castles and towers were erected in almost every part, and every habitation was constructed with a a view to defence as well as residence. Resistance to the plunderers led to scenes of blood, and bloodshed laid the foundations of deadly feuds. The borderers acted for the most part as light cavalry, called 'prickers;' they rode small but nimble and well-trained horses. Those who acted as infantry were of excellent skill and courage. They had their places of rendezvous, to which they repaired at the signal of their beacon fires. The English borderers excelled in the use of their national weapon, the long bow; and their onset, when they closed, was signalised by the war-cry or 'slogan.' The fierce and unsettled habits caused by such a condition continued till modern times. The inhabitants of the eastern border, toward Berwick-upon-Tweed, were first brought into a more peaceful way of life; but amid the wastes and fastnesses of the western side of the county the borderers have only at a comparatively late period become assimilated to the rest of their countrymen.

In the reign of William Rufus, Northumberland was twice invaded by Malcolm III. Canmore, king of Scotland. His first invasion (A.D. 1091) was retaliated by William, and Malcolm was compelled to submit. In his second invasion (A.D. 1093), after committing great ravages, he was surprised and slain, with his eldest son Edward, while besieging the castle of Alnwick, by Robert de Moubray, earl of Northumberland. This Robert soon after conspired, with other nobles, against William; but that king crushed the conspiracy by his alertness, besieged successively Tynemouth and Bamborough castles, and took Moubray prisoner.

Upon the accession of Stephen to the throne of England, David, king of Scotland, having determined to support the claims of the empress Maud, invaded the north of England and took Wark and Norham castles, and the towns of Alnwick and Newcastle. He failed in his attempt to take Bamborough; and upon the advance of Stephen peace was made (A.D. 1135 or 1136). A short time afterwards David, taking advantage of Stephen's absence in Normandie, again broke into Northumberland, to support the claim of his son Henry to the earldom of that county; but agreed to a truce until Stephen should return and give his decision of the claim. On the refusal of Stephen to admit this, war recommenced (A.D 1138). Wark Castle was besieged, but in vain, and the western side of the county ravaged, as far as the Tyne. On the approach of Stephen, the Scots retreated, but when the English king retired, they again advanced, and ravaged the eastern side of the county. Norham Castle was taken and demolished, and Wark a second time besieged, but with no better success than formerly; it was however blockaded. Upon David's return to Scotland, after his defeat in the battle of the Standard at Northallerton, he resumed the siege of Wark, and at length obliged the garrison by famine to capitulate (A.D. 1138). Peace was soon after concluded, and Henry's claim to the earldom admitted (A.D. 1139). This earldom was taken from the Scottish royal family by Henry II., and that of Northampton bestowed as a compensation.

In the civil strife near the close of the reign of Henry II., William the Lion, king of Scotland, supported the rebellious princes; and entering Northumberland, besieged Wark Castle, which had been restored (A.D. 1173). The siege failed, and the English in return crossed the Tweed and burned Berwick; but hostilities were suspended by a truce. On the expiring of the truce, the county was again invaded by the Scots. Harbottle and Warkworth castles were taken, and Prudhoe and Alnwick castles besieged. While before the latter, the Scottish king was surprised and taken prisoner (A.D. 1174). This event led to a peace.

In the civil troubles of the reign of John, Northumberland again was the scene of hostility (A.D. 1215). The insurgent barons were supported by the king of Scotland, who hoped to possess himself of the county. Norham Castle was vainly besieged by the Scots. Morpeth, Alnwick, and Wark were destroyed, to prevent their falling into the hands of John; and the town and castle of Berwick were taken and afterwards burned by his mercenaries, who advanced into Scotland and captured several towns. The king of Scotland received from the dauphin Louis (whose claim to the English crown he admitted) the cession of Northumberland and some other of the northern counties; but he did not succeed in gaining possession of them; and at the peace concluded about the commencement of the reign of Henry III. they remained still attached to England.

In the reign of Henry III. the Scottish king Alexander II. invaded Northumberland and advanced to Ponteland, while Henry with the English army was at Newcastle (A.D. 1244). Peace was however made without a battle.

When war broke out between Edward I. and John Baliol, king of Scotland (A.D. 1296), the king of England assembled his army at Newcastle, and marched to the relief of Wark, which was threatened by the Scots. He crossed the Tweed, took Berwick by storm, and after making a general carnage of the male inhabitants and defenders (except the garrison of the castle, which surrendered upon terms) and sending the women into Scotland, repeopled the town with English settlers. In retaliation the Scots invaded Northumberland, besieged Harbottle Castle, but in vain; ravaged the districts of Redesdale and Tindale; destroyed Corbridge; burned the town, monastery, and church of Hexham, and committed other devastations (A.D. 1296). A year after they again entered the county under Wallace, after defeating the English at Stirling and recapturing Berwick, and having established their head-quarters in Rothbury Forest, devastated the country all round; and, after a vain attempt upon Newcastle and Carlisle, returned to their own country (A.D. 1297). Early the following year the English army assembled at Newcastle, and, marching into Scotland, entered Berwick, which the Scots had deserted.

Edward II. was at Newcastle (A.D. 1310) in an expedition against the Scots; and spent the winter of 1310-11 at Berwick, which might at this time be considered as an English town. Next year, while Edward invaded Scotland, Robert Bruce ravaged Tindale and Redesdale in Northumberland. In 1312 the king and his favourite Gaveston were surprised by the insurgent barons at Newcastle, and with difficulty escaped to Tynemouth, and thence by sea to Scarborough. In the same year the Scots again invaded the county, burned Corbridge and Hexham, and made a vain attempt on Berwick. The English army was assembled at Wark (A.D. 1314), and marched to Berwick previous to the great battle of Bannockburn. After that disastrous defeat, Northumberland was ravaged almost without resistance, and the victorious Scots penetrated into Yorkshire. A part of the inhabitants of Tindale and Redesdale were obliged to swear

allegiance to the king of Scotland; and the ravages of war reduced the inhabitants of the north of England to such distress, that they were obliged to eat the flesh of dogs and horses, and a quarter of wheat was sold *for forty shillings*, an enormous price at that time. The disorganised state of society led also to the formation of numerous bands of marauders. In 1318, Berwick, and the castles of Wark, Harbottle, and Mitford were taken by the Scots, who seized the whole county, except Newcastle and a few strongholds, and penetrated farther into England. Next year (A.D. 1319) the English, under the command of the king, made a strenuous but vain attempt to recover Berwick. In 1320 the Scots penetrated as far as Corbridge, and in 1322 they twice renewed their devastations. Hostilities were afterwards suspended by a truce, which continued till the deposition of Edward II. (A.D. 1327).

At the commencement of the reign of Edward III. the Scots renewed their ravages in this county, and the king, a boy of fifteen, who pursued them with a vast army, was unable to overtake them. In the course of the summer, the Scots took Norham Castle and attempted Alnwick, but failed. Peace soon followed, by which the town of Berwick was restored to Scotland.

In 1333 war broke out again. Edward besieged Berwick and ravaged Scotland; the Scots in return ravaged Northumberland and blockaded Bamborough, where Edward's queen was. The extremity to which the garrison of Berwick was reduced obliged the Scots to march to its relief; they were defeated at Hallidown Hill in the immediate vicinity, and the town capitulated. In 1340 and 1342 the Scots wasted Northumberland; in the latter year they were repulsed in attacks upon Newcastle and the castle of Wark. In 1346 they wasted the southern part of the county. In 1355 they surprised the town of Berwick, but failed in their attempts to take the castle, and early in the following year (1356) the town was retaken.

In the year 1372 the quarrels of the borderers brought on a severe battle at Carham, in which the Scots defeated a superior number of English. In 1378 the castle of Berwick was surprised by a few borderers and held by them against a powerful force for nine days, when it was taken. In 1384 the same castle was betrayed to the Scots, but was recovered by Percy, earl of Northumberland, the father of Hotspur. In 1385, while an English army ravaged Scotland, the Scots broke into Northumberland, ravaged it as far as Newcastle, and took and demolished Wark, Ford, and Cornhill castles. In 1387 the Scots again entered the county and ravaged it; on their return they defeated and took prisoners Hotspur and his brother Ralph, who, at the head of a more numerous army, had attacked them at Otterburn. Earl Douglas, the Scottish commander, fell in this battle, which, it has been supposed, has furnished the subject of the old ballad of 'Chevy Chase.' It is fairly and graphically described, chiefly after Froissart, in Tytler's *History of Scotland*, vol. iii., p. 53.

The early part of the reign of Henry IV. was marked by hostilities on the border. In A.D. 1400 the Scots took and demolished Wark Castle, but were defeated at Fulhopelaw in Coquetdale; another inroad in 1402 was chastised with a similar defeat, and led to the more important battle of Homeldon, or Humbleton, near Wooler, where the earl of Northumberland, his son Hotspur, and the Scotch earl of March, defeated about 10,000 Scots under the earl of Douglas, who was taken prisoner. The revolt of the Percies and the battle of Shrewsbury (A.D. 1403) arose from the king's demanding that they should deliver up the prisoners taken at Homeldon. The town of Berwick, which was held by an adherent of the earl of Northumberland in his second revolt (A.D. 1405), was surrendered to the king's forces, as were the castles in the county held by the earl or his supporters. In the reign of Henry V. (A.D. 1419), Wark Castle was taken by the Scots, and almost immediately retaken.

In the reign of Henry VI. (A.D. 1436) a severe battle was fought at Pepperdean, just within the border of the county, not far from Cornhill, between the earl of Northumberland (the son of Hotspur), or perhaps Sir Robert Ogle, and Douglas, earl of Angus, each with about 4000 men. The English were defeated. This battle has furnished, according to some, the origin of the ballad of 'Chevy Chase,' rather than that of Otterburn; but the presence of the earl of Northumberland is not noticed by some of our authorities. In 1448 war between the two countries was resumed, and the Scots burned Alnwick.

In the civil war of the Roses, most of the barons and other inhabitants of Northumberland embraced the Lancastrian party. The earl of Northumberland (the son of Hotspur) was slain in the first battle of St. Alban's, A.D. 1455, and his son Thomas Percy, lord Egremont, at that of Northampton, A.D. 1460, both fighting on that side. The next earl, son of the preceding, fell, together with his brother Sir Richard Percy, in the great battle of Towton (1461). In the year 1462, Peter de Brezé, a French captain of note, engaged by the Lancastrian party, landed with a small force in Northumberland, and was besieged by the Yorkists in Alnwick, but escaped, by the aid of the Scots, into Scotland. Next year, Margaret of Anjou, queen of Henry VI., landed near Bamborough, and took Alnwick, but withdrew on the approach of Edward IV. into Scotland. Some of her troops, being driven ashore on Holy Island, were made prisoners, and Alnwick, Bamborough, and Dunstanborough castles were taken by the Yorkists. In 1464 the queen re-entered Northumberland with a numerous army. Bamborough castle was surprised, and many of her partisans took arms in her favour. But a party of her forces was defeated at Hedgley Moor, eight or ten miles north-west of Alnwick; and the main body was utterly routed near Hexham by the Lord Montacute, Yorkist warden of the Eastern March (A.D. 1464). In the battle of Hedgley Moor, Sir Ralph Percy, brother of the last earl of Northumberland, was slain; the 'Percy Cross' marks the spot where he fell. Lord Montacute received, as the reward of his victory, the title of Earl of Northumberland and the forfeited inheritance of the Percies. The Yorkists took Bamborough and wasted the Scottish border. Berwick had been delivered up by the Lancastrians to Scotland during these troubles, but was restored to England by treaty (A.D. 1482).

In the attempts of Perkin Warbeck to dethrone Henry VII., Northumberland was invaded by that pretender, in company with an army of Scots and foreigners under James IV. of Scotland. The country was cruelly devastated, but on the approach of an English army the invaders retired (A.D. 1496). Next year James renewed his invasion, but he met with little success either in his attempts to plunder or to master the strongholds of the border. He besieged Norham with vigour, but failed to take it, and soon afterwards withdrew to his own country.

In the reign of Henry VIII. a body of 3000, or, according to some, of 8000 Scots, under Lord Hume, were cut off, on their return from a marauding incursion into the county, at Millfield, near Ford Castle (A.D. 1513). The king of Scotland, James IV., eager to revenge the defeat of his subjects, entered Northumberland the same year with a numerous army, forced the garrison of Norham to surrender upon terms, and took and partly demolished Wark, Etal, and Ford castles. While he dallied with Lady Heron at Ford Castle, the earl of Surrey, the English commander, was advancing with his son Lord Thomas Howard, lord admiral of England, Lord Dacres, and other men of note and power in the north of England, and an army of about 30,000 men: the armies met at Flodden, near the spot where Hume, whose defeat the king desired to avenge, had been overthrown. The Scots were probably more numerous by nearly 10,000 men (Tytler's *Hist. of Scotland: Notes and Illustrations*), but the mismanagement of the king ensured their defeat: James fell on the field, with the greater part of the brilliant train of nobles who had accompanied him, and probably about 15,000 men. In 1523 the county was invaded by the duke of Albany, regent of Scotland, who, with his French auxiliaries, besieged Wark Castle, while the Scots, who refused to support the invasion, remained on their own side of the river. Part of the castle was taken, but the other part held out, and ultimately the assailants were driven off. In 1524 a small force of Scots renewed the invasion, but were defeated at Branxton; and some incursions were made in various years from A.D. 1532-1558. But the advancement of the power of England, and the establishment of better arrangements along the border, combined, with the internal dissensions of Scotland, to diminish the frequency of the Scottish inroads, and to prevent any serious invasion of the realm. In the repeated and destructive ravages of the English in the south of Scotland, Berwick was the point from which the armies usually took their departure.

In the rebellion of the northern earls of Northumberland and Westmoreland against Queen Elizabeth (A.D. 1569), Alnwick and Warkworth castles, which were held by the

earl of Northumberland's retainers, were taken by the queen's officers. The insurgent nobles passed through Hexham in their retreat from Durham into Cumberland. The assassination of the earl of Murray, regent of Scotland, whose vigorous administration had curbed the borderers, was followed by an incursion of the Scots into England (A.D. 1569), and one or two other incursions took place before the union of the two crowns of England and Scotland on the head of James I. Soon after that event, the office of lord warden of the marches fell into disuse, the garrison of Berwick was reduced, and the frontier lost its military character. It was long indeed before border feuds entirely died away; but they ceased to bear the character of national hostilities; and however national feeling might enter into them, they were treated as private quarrels or marauding expeditions.

Of these many centuries of strife and consequent misery this county contains many memorials. The ruins of Norham and Wark castles still overlook the Tweed, and those of Heton, Dudhowe, and Ford rise on the banks of the Till or its tributary streams. Norham is the most striking ruin: the walls of the keep are now reduced to a mere shell; the apartments in the basement are vaulted; the keep is a square tower of four stories above the vaults, built of red freestone very liable to decay. The outworks have been demolished, and part of the hill on which the castle stands has been washed away by the river. Two towers of Ford Castle remain incorporated in a more modern building. Of the others there are only the earthworks and foundations, or perhaps the vaults of the basement. Norham, Heton, and Dudhowe are in Islandshire, which belongs to Durham.

Bamborough and Dunstanborough castles are on the coast. [BAMBOROUGH.] Dunstanborough Castle is protected by steep cliffs on the north and east sides; on the south and west sides it was defended by a wall and towers, which are for the most part yet standing. The keep and other buildings of the interior, except the remains of a chapel, have disappeared. The entrance gateway on the south side is yet standing.

In the interior of the county are Alnwick [ALNWICK] and Warkworth castles, which last has been described already. Of Callaley Castle, near Whittingham, the western tower is of great antiquity: the rest of the building is more modern. Bothall Castle on the Wensbeck, Mitford, Belsay, and Harnham castles, are all near Morpeth. The picturesque ruins of Bothall, which consist chiefly of the gateway, with its flanking towers, and the outer wall of the court in which the keep stood, are on an eminence on the bank of the river. There are considerable remains of Langley Castle near Hexham, and there are ruins of Blenkinsop, Bellester, Thirlwall, and Featherstone castles, near Haltwhistle; of Staward Castle on the banks of the Allen; and of Prudhoe Castle, the antient seat of the Umfranvilles, on the south bank of the Tyne, between Newcastle and Hexham. This last is one of the finest ruins in the county; it stands on a precipitous bank of the river 60 feet high. The gateway, a lofty embattled square tower, the outer wall, and the keep are yet standing; and there are the ruins of the chapel and other buildings.

The hostility to which the county was exposed rendered it necessary for the smaller proprietors to have their dwellings strongly built; their habitations were towers, with the basement vaulted to contain the cattle of the neighbourhood when driven in for shelter. Whitton Tower near Rothbury, now converted into a rectory-house, may be taken as a specimen of these fortified dwellings. The walls are eleven feet thick at the foundation, nine feet in the kitchen, and six feet in the chambers over it. In the basement vaults is a deep well. There are the remains of other similar towers in different parts of the county.

The chief ecclesiastical antiquities of the county are noticed elsewhere. [DURHAM, County; TYNEMOUTH.] Of Hulne Abbey, for Carmelite friars, close to Alnwick, there are some remains. A tower, built by a former earl of Northumberland as a place of refuge for the monks, has been repaired, enlarged, and fitted up by a late duke of Northumberland. Brinkburn Priory near Rothbury, for regular canons of St. Augustin, has been in great part demolished. The tower of the church, part of the side walls, and several pillars and arches remain. They contain various examples of transition from the Norman to the early English styles. There are ruined churches or chapels at Old Bewick, between Alnwick and Wooler; Memmer-kirk, in Coquetdale ward, near the border of Scotland; Bothall near Morpeth; and Jesmond near Newcastle. The ruins of the last are incorporated in a farm-house and offices.

In the troubles of Charles I.'s reign this county suffered considerably. In the first campaign of Charles against the Scots (A.D. 1639), an army of 20,000 Royalists marched northward towards Berwick, but effected nothing; in the second campaign the Scots invaded Northumberland, and advanced to the Tyne. On the 28th August, 1640, they forded that river at Newburn, a few miles above Newcastle. The Royalist infantry, from panic or disaffection, fled, and the horse were defeated with the loss of 300 men. When the war between the king and the English parliament broke out, the Northumbrians chiefly embraced the king's party. William Cavendish, marquis of Newcastle, fortified Tynemouth and Newcastle, and raised a regiment of Royalists at his own charge, at the head of which he fought at the fatal battle of Marston Moor (A.D. 1644). Before that battle the Scots, under Lesley, traversed the county in their march to support the Parliamentary forces, and, returning after their victory, took Newcastle by storm. The mayor, who had retired to the castle, was obliged to capitulate. Cromwell was entertained at Newcastle after his capture of Berwick (A.D. 1648), and again on his way to Scotland, just before his victory at Dunbar (A.D. 1650).

In the rebellion of 1715, the earl of Derwentwater, Lord Widdrington, and Mr. Forster, one of the county members, with several of the gentry, took up arms for the Pretender, marched to Rothbury and Warkworth, at which places they raised the standard of King James. They then marched to Morpeth, being in number about 300, partly Scots. From Morpeth they marched to Newcastle; but finding the gates shut, marched to Hexham, where another body of Scots joined them. They subsequently received larger reinforcements from Scotland at Rothbury and Wooler, under Lord Kenmure and Brigadier McIntosh. On the approach of General Carpenter from Newcastle with a body of government troops, they retired into Scotland. The subsequent transactions of the rebellion were beyond the limits of the county. From 400 to 500 of the English rebels (including 75 noblemen and gentlemen), chiefly Northumbrians, together with about 1000 Scots, were taken at Preston. Derwentwater was beheaded, Widdrington was pardoned, and Forster escaped from Newgate. In the rebellion of 1745-46 this county took no share. The inhabitants of Newcastle armed in support of the government, but were not called upon to act.

(Hutchinson's *View of Northumberland*; *Historical and Descriptive View of Northumberland*, Newcastle, 1811; Greenough's *Geological Map*; Conybeare and Phillips's *Outlines of the Geology of England and Wales*; *Parliamentary Papers*; Rickman's *Gothic Architecture*; Turner's *Anglo-Saxons* and *History of England*; Palgrave's *Rise and Progress of the English Commonwealth*; Hutton's *Roman Wall*; *Beauties of England and Wales*, &c.)

STATISTICS.

Population.—Northumberland may be considered as chiefly a mining county, though a large number of persons are engaged in agricultural pursuits, and some in manufactures. It is the 37th on the list of agricultural counties. Of 53,210 males twenty years of age and upwards, 1262 were engaged, in 1831, in manufactures and in making manufacturing machinery; and of this number 200 were employed at Bykes, in making glass bottles and crown-glass, 130 at Newcastle-upon-Tyne, 48 at Hartley, and 28 at Newburnhall; steam-engines and machinery for the collieries employed 79 men at Newcastle and 20 at Chirton. There were about 90 iron-founders at Bigley and Long Benton. Alkali was made by 99 men at Newsham; at Hexham there were 22 wool-combers and weavers. The spinning of woollen yarn and linen thread employed about 500 persons, scattered in the villages throughout the county. Lead-mills, shot-making, the making of chain-cables, &c., give employment to a few of the population at Elsley, Wylam, North Shields, &c. There were employed in agricultural pursuits 14,085 men, out of which number 10,441 were labourers; 13,939 men were employed as labourers in labour not agricultural.

The population of Northumberland at each of the four following periods, was—

	Males.	Females.	Total.	Increase per cent.
180 .	73,357	83,744	157,101	. .
1811	80,385	91,776	172,161	9·58
1821	95,354	103,611	198,965	15·56
1831	106,147	116,765	222,912	12·03

showing an increase between the first and last periods of 65,811, or more than 29 per cent. on the whole population, being 28 per cent. below the rate of increase throughout England and Wales.

The following table is a summary of the population of every ward, &c., as taken in 1831.

WARDS, TOWNS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in Agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males, twenty years of age.
Bamborough (Ward) .	2,107	2,230	15	66	1,145	513	572	5,194	5,648	10,842	2,606
Castle (Ward) .	11,875	15,817	86	631	1,316	3,394	11,107	33,809	37,724	71,533	15,861
Coquetdale (Ward) .	3,502	4,456	17	159	1,828	1,184	1,444	10,202	10,919	21,121	5,286
Glendale (Ward) .	2,198	2,363	7	72	1,224	437	702	5,795	6,214	12,009	2,852
Morpeth (Ward) .	2,208	2,816	5	92	1,168	744	904	6,468	6,844	13,312	3,509
Tindale (Ward). .	7,508	8,628	33	297	3,282	2,128	3,218	21,082	21,333	42,415	10,832
Berwick-upon-Tweed, Town of . .	1,190	2,118	7	69	111	885	1,122	3,937	4,983	8,920	1,897
Newcastle-upon-Tyne, Town and County of the Town of .	5,048	9,936	50	121	53	4,961	4,922	19,660	23,100	42,760	10,367
Totals .	35,726	48,364	220	1,509	10,127	14,246	23,991	106,147	116,765	222,912	53,210

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of—

		£.		s.	d.	
1801	were	52,416,	being	6	8	for each inhabitant.
1811	. .	72,821	"	8	5	"
1821	. .	77,505	"	7	9	"
1831	. .	74,092	"	6	7	"

The sum expended for the same purpose for the year ending March, 1838, was 61,446*l.*; and if it be assumed that the population increased from the years 1831 to 1838 in the same ratio as in the ten years preceding 1831, the above sum gives an average of 5*s.* 1*d.* for each inhabitant. These averages are below those for the whole of England and Wales.

The sum raised in Northumberland for poor-rate, county-rate and other local purposes, in the year ending 25th March, 1833, was 99,747*l.*, and was levied upon the various descriptions of property as follows:—

On land . .	£60,921	5*s.*
Dwelling-houses .	21,765	17
Mills, factories, &c. .	12,411	1
Manorial profits, navigation, &c.	4,649	0
Total	£99,747	3

The amount expended was—

For the relief of the poor . . .	£73,792	5*s.*
In suits of law, removal of paupers, &c.	4,257	14
For other purposes . .	22,461	8
Total money expended	£100,511	7

In the Returns made up for subsequent years the descriptions of property assessed are not specified. In the years 1834, 1835, and 1836, there were raised 95,655*l.* 8*s.*, 87,054*l.* 6*s.*, and 81,402*l.* 15*s.*; and the expenditure of each year, from 1834 to 1838, was as follows:—

	1834.	1835.	1836.	1837.	1838.
	£	£	£	£	£
For the relief of the poor	[illegible]	[illegible]	[illegible]	[illegible]	61,446
In suits of law, removal of paupers, &c.	[illegible]	[illegible]	[illegible]	4,174	[illegible]
Payments towards the county-rate	[illegible]	[illegible]	[illegible]	not given	[illegible]
For all other purposes		[illegible]	[illegible]	[illegible]	[illegible]
Total money expended	[illegible]	[illegible]	[illegible]		[illegible]

The saving effected in the sum expended in 1838, as compared with that expended in 1834, was therefore 22,011*l.*, or 23 per cent.; and the sum expended for the relief of the poor in 1838 was less than that in 1834 by 16,537*l.*, or rather more than 14 per cent.

The number of turnpike trusts in Northumberland, as ascertained in 1836, was 14 (Acts 3rd and 4th William IV., c. 80); the number of miles of road under their charge was 479. The annual income arising from tolls and parish composition in lieu of statute duty in 1836 was [illegible], and the annual expenditure in the same year was as follows:—

	£.	s.	d.
Manual labour . .	5,546	16	0
Team labour and carriage of materials	1,706	10	0
Materials for surface repairs .	2,519	8	0
Damages done in obtaining materials	127	2	0
Tradesmen's bills . .	540	3	0
Salaries of treasurer, clerk, and surveyor	1,336	0	0
Law charges . . .	993	11	0
Interest of debt . . .	3,207	8	0
Improvements . . .	1,607	5	0
Debts paid off . . .	3,017	6	0
Incidental expenses . .	292	6	0
Estimated value of statute duty performed . . .	1,711	19	0
Total expenditure	£22,635	14	0

The county expenditure in 1834, exclusive of that for the relief of the poor, was 9,066*l.* 12*s.*, disbursed as follows:—

	£.	s.	d.
Bridges, building, repairs, &c.	3,300	10	0
Gaols, houses of correction, &c., and maintaining prisoners, &c. .	2,481	10	0
Shire-halls and courts of justice, building, repairing, &c. . .	102	13	0
Prosecutions . . .	646	13	0
Clerk of the peace . .	696	14	0
Conveyance of prisoners before trial	78	8	0
Vagrants, apprehending and conveying	43	19	0
Coroner . . .	126	4	0
Miscellaneous . . .	1,590	1	0
Total expenditure	£9,066	12	0

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 612, 570, and 719 respectively, making an average of 87 annually in the first period, of 81 in the second period, and of 103 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 27, 26, and 35 respectively. Among the persons charged with offences there were committed for—

	1831.	1832.	1833.
Felonies . .	20	19	27
Misdemeanors .	7	7	6

The total number of committals in each of the same years was 27, 26, and 33 respectively.

	1831.	1832.	1833.
The number convicted was .	22	24	24
The number acquitted was .	4	—	8
Discharged by proclamation . .	1	2	1

There were 159 persons charged with crimes at the assizes and sessions in Northumberland in 1838. Of these 18 were charged with offences against the person, 12 of which were common assaults; 19 were charged with offences against property committed with violence; 115 with offences against property committed without violence; only 1 was charged with a malicious offence; 5 for uttering counterfeit coin, and 1 for various misdemeanors. Of the whole number committed 130 were convicted, 22 were acquitted, 2 were not prosecuted, and no bill was found against 5. Of those convicted one was sentenced to death, whose sentence was commuted to transportation for 10 years; 24 were transported for various periods; 7 were sentenced to imprisonment for 2 years or above 1; 29 for 1 year or above 6 months; and 65 for 6 months or under; 4 were fined. Of the whole number of offenders, 112 were males and 47 females; 44 could neither read nor write, 86 could read and write imperfectly, 24 could read and write well, 1 had received superior instruction, and the degree of instruction of the remaining 4 could not be ascertained.

The number of persons registered to vote for the county members in 1837 was 8756. Of these, 4897 were freeholders, 258 copyholders, 3195 occupying tenants, 14 trustees, 28 mortgagees, and 364 annuitants; being 1 in 25 of the whole population, and 1 in 6 of the male population 20 years of age and upwards, as taken in 1831.

Northumberland contains 6 savings' banks; the number of depositors and amount of deposits, on the 20th of November in each of the following years, were as follows:—

	1832.	1833.	1834.	1835.
Number of depositors . .	6539	7224	6275	7356
Amount of deposits . .	£280,014	£286,572	£258,076	£295,118

The various sums placed in the savings' banks in 1836, 1837, and 1838, were distributed as under:—

	1836.		1837.		1838.	
	Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	3,335	£27,905	3,611	£34,800	3,937	£33,703
,, 50	2,795	86,265	2,949	90,301	3,112	95,599
,, 100	1,286	87,364	1,408	96,756	1,436	98,370
,, 150	432	51,865	467	55,812	520	62,700
,, 200	263	43,858	275	45,951	272	45,832
Above . . 200	95	23,919	95	23,886	84	20,513
	8,206	321,176	8,805	344,506	9,361	356,715

Education.—The following summary is taken from the Parliamentary Returns on Education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant schools . . .	5		
Number of children at such schools; ages from 2 to 7 years:—			
Males . .		156	
Females . .		153	
Sex not specified .		176	
			485
Daily schools . . .	625		
Number of children at such schools; ages from 4 to 14 years:			
Males .		11,788	
Females . .		8,439	
Sex not specified .		3,870	
			24,097
Schools . .	630		
Total of children under daily instruction			24,582
Sunday-schools . . .	218		
Number of children at such schools; ages from 4 to 15 years:—			
Males . .		7,057	
Females . .		7,070	
Sex not specified .		1,748	
			15,875

Assuming that the population has increased in the same ratio as it did in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 years would have been, in 1833, about 75,790; provided also the population between those ages had increased in the same proportion with the rest of the population since 1821. Six Sunday-schools are returned from places where no other school exists, and the children (139 in number) who are instructed therein cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Twenty schools (containing 1127 children), which are both daily and Sunday schools, are returned from various places, and duplicate entry is known to have been thus far created. Making allowance therefore, from this cause, for the want of accuracy, we may perhaps consider that not more than half of the children between the ages of 2 and 15 are under instruction.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	—	—	1	150	—	—	4	335
Daily Schools	51	2262	33	2,460	505	17,002	36	2373
Sunday Schools	1	34	208	16,235	1	40	8	566
Total...	52	2296	242	18,845	506	17,042	48	3274

The schools established by dissenters, included in the above statement, are—

			Scholars.
Daily-schools . .	5,	containing	461
Sunday-schools . .	53	,,	9141

The schools established since 1818 are—

Infant and other daily schools	296,	containing	11,018
Sunday-schools . .	172	,,	13,550

Twenty-four boarding-schools are included in the number of daily-schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by dissenters, with whom are here included Wesleyan Methodists and Roman Catholics.

Lending libraries of books are attached to 57 schools in this county.

NORTHWICH, a town in the parish of Great Budsworth, hundred of Northwich and county of Chester, 17 miles north-east by east from Chester, and 160 miles north-west from London, direct distances. It is situated on the banks of the Weaver, near the confluence of that river with the Dane, and its site extends over some parts of the neighbouring townships of Witton, Castle Northwich, Winnington, Marsdon, Leftwich, and Anderton, in addition to the township of Northwich. The high road from London to Liverpool passes through the town, and is there intersected by the road joining Manchester and Chester. The streets are irregular and badly paved, but lighted. Many of the houses are of considerable antiquity. The church is large, and chiefly remarkable for its semicircular choir. According to Camden (Gough, ii., p. 425) this place was called by the ancient British *Hellath du*, or the *black salt-pit*. The salt-mines in the neighbourhood are very extensive, and have been worked since 1670, if not before.

Dr. Aikin, in his 'Description of the Country Forty Miles round Manchester,' London, 4to., 1725, mentions a tradition of the inhabitants tending to prove that both the salt-mines and brine-springs were wrought during the occupation of Britain by the Romans. At the present time the productiveness of these mines probably surpasses that of any other mines in the world. The greater part of the rock-salt requires to be purified, by being dissolved in water, which is subsequently evaporated over large furnaces, before it is fit for general use. Their average annual produce is about 60,000 tons; that of the brine-springs, which are usually met with at from 90 to 120 feet beneath the surface, is about 46,000 tons. The total annual produce of the Cheshire salt-works is estimated at 156,000 tons, of which about 16,000 tons are consumed in Great Britain. Vessels of 50 to 80 tons burthen are constantly employed in transporting the salt, by means of the rivers Weaver and Mersey, to Liverpool. The reader will find much information relative to the salt-district of Cheshire in a paper by Mr. Holland, published in the first volume of the 'Transactions of the Geological Society,' and also in that gentleman's 'Survey of Cheshire,' drawn up for the Board of Agriculture. The market-day is Friday; the fairs are held 10th April, 2nd August, and 6th December. The popula-

tion of the town, in 1831, was 1481. The free grammar-school spoken of in several topographical works under the head of Northwich, is the free grammar-school at Witton, an adjoining township, to which also the church above mentioned properly belongs. The school was founded in 1558, 'by Sir John Dayn, a parson of one of the St. Bartholomews in London, and among other lands he gave unto it the Saracen's Head in the citie of Chester.' (*King's Vale Royal*, London, 1656, fol. p. 84.) A copy of the statutes, which are curious and interesting, will be found in Carlisle's 'Description of Endowed Grammar-Schools.'

(*Beauties of England and Wales; Population Returns*, &c.)

NORWAY, a country in Europe which comprehends the western portion of the Scandinavian peninsula, extends from 58° to 71° N. lat. Its most southern point, Cape Lindesnaes, is in 57° 58′ N. lat., and the most northern, Cape Nordkyn, in 71° 8′ N. lat. It lies between 5° and 28° E. long. Its length is about 1100 miles, but its width varies: the width is greatest near 61° N. lat., where it is about 250 miles wide, and smallest between 67° and 68° N. lat., where the deep inlets of the sea terminate at a distance of less than twenty miles from the boundary of Sweden. Its surface, according to Forsell, is nearly 134,500 square miles, or about 20,000 square miles more than the area of the British islands. On the north and west it is surrounded by the Atlantic, and on the south by the North Sea and the Skager-rack. East of it is Sweden, and towards the northern extremity is Russia.

By far the greatest part of this extensive country is covered with mountains, which constitute an immense rocky mass, called in the southern part Norrska Fiellen, and in the northern Kiölen. [NORRSKA FIELLEN.] More than three-fourths of the country are above 2000 feet higher than the sea-level, and unfit for cultivation, except in a few well-sheltered places. More than half of the remaining fourth is above 800 feet higher than the surface of the sea. About one-tenth of the surface rises to the height of 800 feet, and perhaps about one-thirtieth part is below 300 feet. The lowest tract, that which does not rise to 300 feet, is situated on both sides of the Bay of Christiania. The more elevated country, that which rises to between 300 and 800 feet, partly surrounds this low tract, and partly extends along the shores of the Skager-rack, or encloses the Bay of Trondhiem on the south and east. Cultivation is nearly limited to these two regions. In all the other parts of the country cultivation occurs only in the narrow valleys by which the rocky masses are indented. A part of the mountain-masses, calculated to amount to 3284 square miles, is always covered with snow. As to the nature of the lower country see CHRISTIANIA; CHRISTIANSAND; and TRONDHIEM.

Rivers, Bays, and Lakes.—As all the rivers of this country rise at a great elevation above the sea, and have a comparatively short course, they are not fit for navigation. Some of them however are used to float down timber, at least in a part of their course. The largest of these rivers is the Glommen-elf, which rises between 62° 30′ and 62° 40′ N. lat., on the declivities of the Rute Fiell, in two small lakes, one of which is 3000 and the other 3627 feet above the sea-level. The two small streams which issue from them fall into the lake of Oresund, which is nearly fifteen miles long, about three wide, and 2400 feet above the sea. Flowing from this lake the river passes near the town of Röraas, and running in a south-south-western direction, skirts the base of the high peak of the Tron-Fiellet, which is nearly 3600 feet high, and then turning nearly south, it enters the cultivable region, in which it continues its southern course to Kingsvinger. At this place it turns abruptly to the west, but after running a few miles in that direction it again changes to the south-south-west, and passing through the lake of Oiern, which is fifteen miles long and about three miles wide, it enters the Skager-rack near Fredrickstad. The last of its numerous cataracts occurs near Hafslund, about ten miles from its mouth; it is called the Sarpe Foss (or cataract), and is sixty feet high. Below this place the river is navigable for large boats. It is remarkable that during the high floods, after the melting of the snow in spring, a part of the water of this river is discharged into lake Wenern in Sweden, by the Wranga-elf, at the sharp turning of the river at Kingsvinger. The whole course of the Glommen probably exceeds 400 miles. Below Kingsvinger the Glommen is joined by the Wormen-elf, the outlet of Lake Miösen, which receives its waters from the mountain-plain lying south-west of the Snee-hättan, by the river Lougen. This river originates in a series of small lakes, called Lessöevarks Vand, west-south-west of the Snee-hättan, which are more than 2000 feet above the sea, and discharge their waters by two outlets, the Romsdals-elf, which runs north-west, and the Lougen, which flows south-east. After a course of nearly 150 miles the Lougen enters Lake Miösen, which is nearly 60 miles long and from one to more than five miles wide; it is more than 420 feet above the sea-level, and lies in the middle of the best cultivated portion of Norway. The Wormen-elf runs about twenty miles with a gentle current. The Drammen-elf originates on the eastern declivity of the Norrska Fiellen in two branches, the Beina-elf and the Snarum-elf. After a rapid course of more than one hundred miles the two branches unite about forty-five miles above their influx into the Gulf of Christiania, into which the Drammen-elf enters by a wide æstuary called the Drammen Fiord. Much timber is floated down this river.

The other rivers remarkable for the length of their course are, the Louven-elf, the Skeen-elf, and the Otter or Torrisdals-elf, which run from 120 to 150 miles each; and, like the Glommen-elf and Drammen-elf, fall into the Skager-rack. No considerable river falls into the Atlantic south of the Namsen-elf, which has its mouth between 64° and 65° N. lat., and runs nearly one hundred miles through a well-wooded valley. The Alten-elf falls into the Alten Fiord, near 70° N. lat. It runs northward about one hundred miles, first through an inclined plain, but against the declivity of the plain, so that its bed sinks lower and lower below the surface of the country as it proceeds farther north. In the lower part of its course it crosses the Kiölen Mountains by an exceedingly deep and narrow valley, which at last becomes a mere fissure, into which no person has yet been able to penetrate. It issues from this fissure by the cataract of Pursoronka, fifteen miles from its mouth. The Tana-elf, which for the greatest part of its course forms the boundary-line between Norway and Russia, originates east of the source of the Alten-elf, and descends from a plain which declines towards the north-east, in which direction the river flows more than two hundred miles, until it approaches the Varanger Fiord, where it suddenly turns to the north and falls into the Tana Fiord, after a course of nearly three hundred miles. It is the least rapid of the rivers of Norway, but it flows through so sterile a region as to be entirely useless.

The numerous inlets of the sea by which the coast of Norway is indented, and which in several places extend seventy or eighty miles inland, would be of great advantage if the adjacent country possessed only a moderate degree of fertility. But on the shores of these inlets high and bare rocks rise several thousand feet; yet these inlets contain the only habitable places along the western coast, and abound in fish. The Fiords of Christiania and Trondhiem are an exception, being surrounded by fertile tracts: they are noticed under CHRISTIANIA and TRONDHIEM. The other inlets which are remarkable for their extent are the following, from south to north.

Bukke Fiord is wide at its entrance, and penetrates by two of its branches more than fifty miles inland. Hardanger Fiord is about seventy miles long; Sögne Fiord, which is narrow, and more than eighty miles long, is surrounded by the highest region of the Norrska Fiellen. There is a great number of narrow deep fiords between Sögne Fiord and Trondhiem Fiord, and of bays farther north. The largest and widest occur at the northern extremity, where the Porsanger Fiord is 150 miles long and 20 miles wide on an average. The Laxe Fiord, Tana Fiord, and Varanger Fiord are considerable, but of less extent.

Numerous lakes occur in the southern districts of Norway, on the eastern declivity of the Norrska Fiellen. Many of them are more than 2000 feet above the sea-level, and all of them are very deep. Lake Fämund, near the boundary of Sweden, is 2280 feet above the sea-level, and extends in length more than seventy miles, with an average width of more than three miles. From its southern extremity issues a river, which, under the name of Klar-elf, falls into Lake Wenern in Sweden.

Climate.—The climate differs considerably in the different districts of a country which extends over thirteen degrees of latitude, and on both sides of the polar circle, and also rises in the largest part of its surface to a mean

elevation exceeding 2000 feet above the sea. The mean temperature of Christiania is 42° Fahr., or not quite 8° less than that of London. It is probable that in the valleys near Cape Lindesnaes, where the beech grows to a stately tree, the mean temperature is higher. At Bergen, it is 46° 7′, and even at Trondhiem it is 40°. The difference in the mean temperature between Christiania and Bergen may be chiefly attributed to the difference of temperature of the winter, which is severe on the eastern declivity of the Norrska Fiellen and the adjacent countries, but very mild along the western coast, on account of the prevailing western winds and frequent fogs. This is evident from the following table:—

	Mean temperature.			
	In Winter.	Spring.	Summer.	Autumn.
Christiania	+ 25	+ 38	+ 60	+ 42
Bergen	+ 36	+ 45	+ 58	+ 48
Trondhiem	+ 24	+ 35	+ 61	+ 40
North Cape	+ 24	+ 30	+ 42	+ 32

The mean temperature of North Cape is 32°, or the freezing point, but the winter is not more severe than at Trondhiem. The greatest cold at North Cape is felt when north-easterly winds blow, but the sea is always open, and the drift-ice from Spitzbergen does not approach the coast. The violence of the winds however renders this spot nearly uninhabitable. It greatly exceeds what is felt in other northern countries, and when the wind blows no person ventures to leave his dwelling. More than two-thirds of the year are boisterous, and in autumn and winter the storms are incessant, and rage with incredible fury. On the approach of winter the snow-storms frequently last for many days and weeks. They are preceded by heavy fogs, which advance from the ocean in immense masses, like impenetrable walls or moving bodies of water; but they occur only during westerly winds. The weather is fine and clear when the wind blows from the east. The longest day lasts from the 15th of May to the 29th of July, which is two months and a fortnight; the longest night, from the 19th of November to the 26th of January, which is two months and ten days. During the long nights the aurora borealis shines with uncommon brightness, so that the fishermen are enabled to carry on their ordinary occupation just as well as by daylight. (Von Buch.) Gales are very frequent along the whole of the western coast. Thunder-storms are as common there in winter as in summer, but north of 66° thunder-storms do not occur. No traces of volcanic action are known to exist, except that lava occurs on an island not far from Bergen, and on a mountain in the Bukke Fiord fire is said to appear sometimes. Earthquakes occur, though rarely.

Productions.—The forests constitute the principal wealth of Norway. Beech occurs only south of 59¼° N. lat.: oak, elm, and lime trees as far north as 63°; apples, cherries, and prunes are found as far as 64°, but they do not ripen every year. Gooseberries and hazel-nuts extend to 65° N. lat., and so far oats, peas, beans, and flax are cultivated. Hemp and rye are grown to 66° N. lat., and the ash and spruce-fir reach this point. Pines grow as far as 67° N. lat., but north of 67° only birch and juniper grow, and only barley and potatoes are cultivated. Extensive forests of fir and pine cover the eastern declivity of the Norrska Fiellen, and a great part of the hilly and rocky country east of the range; and it is from these regions that the greatest part of the timber is brought to the sea. On the lower country along the Bay of Trondhiem, and in the valley of the river Namsen, there are also great forests of fir and pine. Though agriculture is not neglected, the produce of the crops is not sufficient for home consumption.

Cattle and goats are numerous, but sheep are rare. The horses are of a small size in the southern districts, but larger to the north of Trondhiem: they are strong and hardy. Bears, wolves, foxes, gluttons, ermines, as well as rein-deer, elks, deer, and hares, abound. The lemming exists in great numbers, and in its migration destroys every plant in its way. [MURIDÆ, p. 501.] Different kinds of sea-fowl abound along the northern coasts, and their eggs constitute the principal food of the inhabitants of some districts during a part of the year; but they are only procured at the risk of life. In these parts the eider-duck is numerous, and the feathers are of great value for beds; a small quantity of them are exported. The sea furnishes the principal means of subsistence to the inhabitants of the western coasts; cod and herrings are most abundant, and this fishery gives occupation to many families. [BERGEN.] Salmon abounds, and is finer than in any other country in the world. Lobsters are found in the greatest abundance on both sides of Cape Lindesnaes, between Hellesund east of Christiansand and Lister Fiord north-west of Lindesnaes. They are sent to the London market. [NORTH SEA.] As to the mineral productions, see NORRSKA FIELLEN. Salt is made from sea-water at some places along the Skager-rack, but not in sufficient quantity for home consumption.

Inhabitants.—The Norwegians, like their neighbours the Danes and Swedes, are of Teutonic origin, and speak a language which differs very little from the Swedish. It is supposed that the language of the Norwegians has undergone less change than that of their neighbours. In the most northern districts, north of 69°, there are many families of Finlanders and Laplanders: the former are here called Quäns, and the latter Finners or Finlanders. The Quäns cultivate barley and potatoes, and rear cattle. The Finners are mostly fishermen, except a certain number of families who live on their herds of rein-deer. In winter they go to Sweden.

Political Division; Population; Manufactures; Commerce; Navigation.—Norway was from an early period divided into four bishoprics: Christiania, Christiansand, Bergen, and Trondhiem; and afterwards, under the Danish dominion, the civil administration of the country was regulated in accordance with the ecclesiastical establishment, a civil governor, called Stifthauptmann, being appointed for every bishopric. But though the bishopric of Trondhiem has been divided into two, Trondhiem and Nordland, both continue to constitute one civil administration. Norway is subdivided into seventeen bailiffrics or districts, the extent and relative population of which appear in the following table, which is formed from that which is given in Forsell's 'Statistik von Schweden:'—

Names of the Districts.	Area in English square miles.	Population.	Number of Inhabitants in a sq. mile.
Smaalehnenes	1,625	62,921	39
Aggerhuus	2,028	90,216	44
Hedemarkens	10,475	77,929	7
Christians	10,367	90,903	9
Buskereds	5,269	76,669	11
Iarlsbergs and Laurvigs	943	54,516	58
Bradsbergs	6,121	63,139	10
Nedenaes	4,685	45,842	10
Mandals	2,247	54,252	24
Stavangers	4,672	62,859	13
Söndre Bergenhuus	6,918	104,471	15
Nordre Bergenhuus	8,272	69,778	8
Romsdals	6,532	70,174	11
Söndre Trondhiems	7,808	77,714	10
Nordre Trondhiems	9,541	57,791	6
Nordlands	16,370	57,791	4
Finmarkens	30,236	33,394	1
	134,309	1,150,000	

Of this population only 124,917 individuals live in towns, and 1,025,083 are dispersed over the country. Perhaps less than half the population gain their subsistance chiefly by cultivating the ground. The remainder employ themselves chiefly in the fishing of cod, herring, salmon, and lobsters, and in preparing the produce of the forests for the market, and in working in the mines. The manufacturing industry is comparatively very small. The most numerous manufacturing establishments are saw-mills, the erection of which is much facilitated by the rapid course of the numerous rivers, even near the sea-shore. There are also several iron and copper works, potash-houses, glass-houses, powder-mills, nail-forges, and two salt manufactories. Linens and coarse woollen cloths are made by the country-people for home consumption. In Christiania and Trondhiem there are some manufactories of cloth, cotton stuffs, and tobacco; there are also a few sugar-houses and tanneries.

The foreign commerce is considerable, as the greatest part of the produce of the forests, the fisheries, and mines is sent out of the country. The timber goes almost exclusively to Great Britain, and consists of planks, deals, and masts of excellent quality, and also tar, to which lately fire-wood has been added as an important article. The produce of the fisheries goes partly to Spain and the Mediterranean, to which places the cod is sent [BERGEN], and partly to the Baltic, where the herrings find a ready sale, and partly to England, especially the lobsters, which, as already observed,

are sent to the London market. Iron is not exported, there being hardly sufficient for home consumption, but copper is exported from Trondhiem to Holland. Cobalt goes to Hamburg and Holland. Minor articles of exportation are furs and eider-down. This commerce is almost entirely carried on in Norwegian vessels. The inhabitants are excellent seamen, a great number of them being occupied during the greatest part of the year, and during the coldest season, in fishing off the Lofoden Islands. The country supplies all the materials for ship-building. The frugality of the Norwegians qualifies them to be the carriers for other countries, so that their vessels frequently visit countries with which they have no direct commerce.

History and Constitution.—The Norwegians first appear in history as pirates, who frequently visited and laid waste the countries bordering on the North Sea. Norway was then governed by a great number of small princes, whose ambition led them to continual wars. When there was no opportunity of satisfying their passion for war at home, they sailed to the neighbouring countries for the purpose of enriching themselves by plunder, and thus acquiring greater influence in their own country. They discovered and settled Iceland. In the second half of the ninth century (875) the small kingdoms were united under King Harold Harfagra, and from that time they became still more troublesome to their neighbours, until Norway was connected with Denmark, and then the Norwegians accompanied Sveno and Knut to the conquest of England. But the two kingdoms were soon separated again, and remained so till 1387, when Margaret became queen of Denmark and Norway. From that time till 1814 both countries remained united, and Norway was administered by a governor, appointed by the king of Denmark. By the convention of Kiel, agreed to on the 14th of January, 1814, between Denmark and Sweden, Norway was ceded to the king of Sweden. A Danish prince, Christian Frederic, who was governor of Norway at that time, and had succeeded in gaining the affections of the nation, made an attempt to constitute Norway a separate kingdom. For that purpose he called together a national assembly at Eidswold, where, on the 17th of May, the outlines of the present constitution were laid down. On the 5th of August he assembled the legislative body, or Storthing, in Christiania. But the Swedes soon entered the country with an armed force, and the prince, who had assumed the title of king, was obliged to abdicate the royal dignity on the 7th of October. On the 20th of the same month the union of Norway and Sweden was determined in the Storthing, and the constitution received its present form on the 4th of November, 1814. On the 31st of July, 1815, it was promulgated as the fundamental law of the country, and was assented to by the Swedish legislature on the 6th of August. In this way both countries were united under one king, though their constitutions differ widely from one another.

The legislative body, or Storthing, is composed of the representatives of the people. They are not however elected immediately by the people, but by electors who are chosen by the citizens. In the cities 50 citizens, and in the country 100, elect one elector. The electors unite and choose the representatives, either from among themselves or other persons. The number of the representatives must not be less than 75 nor above 100: two-thirds must be chosen by the electors of the country, and the remaining third by those of the cities. The representatives must be thirty years of age and must have resided in Norway not less than ten years. The members of the state council and the persons employed in state offices cannot be representatives, nor can those who belong to the royal household: but clergymen are eligible. The king or his lieutenant opens the Storthing, immediately after which it separates into two bodies, the Lagthing (or legislative body) and the Odelsthing (assembly of landed proprietors). The Lagthing consists of one-fourth of the members of the Storthing chosen by the whole assembly. The Storthing is empowered to abolish old and to enact new laws, to impose taxes or abolish or change them, to determine the civil list of the king and the salaries of the persons employed by government, &c. Every bill must originate in the Odelsthing; it may be proposed by a member or by one of the state councillors. When the bill has passed, it is brought into the Lagthing, who may adopt or reject it. In the latter case it is returned to the Odelsthing, with the reasons for such rejection. When a bill has twice passed the Odelsthing, and has been twice rejected by the Lagthing, both bodies unite and decide the matter in question by a joint vote. If two-thirds are not in favour of the bill, it is rejected. When a bill has passed the legislative bodies, it is sent to the king, whose signature gives it the force of law. If the king does not assent, he sends the bill back, observing only that he does not think it useful. In this case the matter cannot be discussed in the same Storthing; but the following Storthing may pass the same bill, and the king has a right to reject it a second time: but if the third Storthing pass the bill, it becomes a law, whether the king sign it or not. The law by which nobility was abolished in 1821 received the king's signature after having passed in three Storthings. The Storthing meets once in three years, on the 1st February, and the session cannot last more than three months. The members are only chosen for one Storthing. The king may in the interval convoke an extraordinary Storthing, consisting of those persons who were members of the last regular Storthing.

The executive power is vested in the king. The Storthing does not interfere in any way with his arrangement of the department of war. But before the king declares war he must inform the council of state at Christiania of such proposed step. This council is composed of a minister of state, seven state councillors, and a secretary of state, all of whom must be natives of Norway. When the king is not in Norway, the minister and two of the councillors are with him, and the others, who remain in Norway, govern the country in conjunction with the governor, who must not be a Norwegian, but may be a royal prince, in which case he is called viceroy. When the king has informed the Norwegian government of his intention to declare war, he assembles the Norwegian and Swedish councillors of state, explains to them the motives which compel him to take such a step, and asks their opinion. The opinion of each member is taken down in writing, and the decision of the matter is left to the king.

The Odelsthing may examine the proceedings of the council of state, and, if there is reason for it, bring it or any member of the body to a trial. The Lagthing, united with the supreme court of justice residing at Christiania, constitutes the court which has jurisdiction in such a case.

(Von Buch's *Travels through Norway and Lapland*; Everest's *Journey to Norway, Lapland, and part of Sweden*; Laing's *Journal of a Residence in Norway*; Schubert's *Reise durch Schweden, Norwegen, Lapland, Finnland, und Ingermannland*; Forsell's *Statistik von Schweden*.)

NORWICH, a city and county of itself, in the county of Norfolk, of which county it is the capital: 97 miles northeast of London, in a direct line; 118 miles by the mail-road through Bishop Stortford, Newmarket, Bury St. Edmund's, and Thetford; or 113 miles by the other mail-road through Chelmsford, Colchester, and Ipswich. It is in 52° 7′ N. lat. and 1° 16′ E. long.

Norwich is not mentioned in history before the time of the earlier Danish invasions. It appears to have risen gradually from the decay of Caister or Castor St. Edmund's, now an inconsiderable village about three miles south of Norwich, but antiently a British and subsequently a Roman town under the name of Venta Icenorum. An old distich records that

> 'Castor was a city when Norwich was none,
> And Norwich was built of Castor stone.'

It is probable indeed that during the time of the Romans the site of Norwich was covered by the waters of the estuary or arm of the sea which at that time penetrated with its many ramifications the eastern coast of the island, and extended, it is likely, to or beyond the town of Venta. [NORFOLK.] By the gradual accumulation of alluvial matter, islands were formed in this estuary, and its waters were divided into several channels. It is probable that even as late as the period of the Norman conquest what is now the lower part of the city consisted of such islands. During the existence of the separate kingdom of the East Anglians [NORFOLK], their kings had erected, upon what was then a promontory on the shore of this estuary and is now the Castle Hill, a royal fortress; and as it is probable that by this time the branch of the estuary which flowed up to Venta either was dry or had become so shallow as to be little available for navigation, the merchants and fishermen deserted Venta to seek new abodes under the protection of the castle, and thus formed a town which, from its situation relative to their former town, obtained the name of North-wic (wic, in Latin *vic-us*, a habitation, or group

of habitations), the northern station or town. Norwich became a place of some importance under the Anglo-Saxon princes, and had a mint. Blomefield, in his 'History of Norfolk,' vol. ii., p. 4, notices the coins of several Saxon princes, Alfred, Athelstan, Edmund I., Edred, Edward the Martyr, and Ethelred II. The circumstance of Alfred coining money here is remarkable, as at the date of this coinage (about 872, according to Blomefield) the government of East Anglia could only have just come into his hands, upon the extinction of the East Anglian dynasty in the person of St. Edmund, and the country either was or had just been in the military possession of the Danes. In the invasion of the Danes under their king Sweyn, A.D. 1004, Norwich was taken and much injured by them. It soon however recovered from this blow, and was in the time of Edward the Confessor a flourishing town, having 1320 burgesses and twenty-five parish churches. It may be questioned if at this time it was exceeded in wealth and population by any place in England, except London, and perhaps York. In the Conqueror's time the castle of Norwich was entrusted to Ralf de Guader, earl of Norfolk; but he rebelling against the king (A.D. 1075), and being defeated, took shipping at Norwich and fled into Bretagne. His wife, who valiantly defended the castle, was obliged to capitulate. The constableship of the castle, with the earldom of Norfolk, was then conferred on Roger Bigot, or Bigod, to whom, on strong presumptive evidence, the erection of the present keep has been ascribed. On the accession of William Rufus the city was damaged by this earl Roger Bigod, who held the castle for Robert of Normandie, William's elder brother. On the peace of 1091, Roger was pardoned and retained his offices. In his time and probably by his encouragement the bishopric of the East Angles was removed from Thetford to Norwich (A.D. 1094), and the foundations of the cathedral were laid by Herbert Lozinga, or Losinga, the bishop. The Conquest and the rebellion of Guader had however materially injured the town, for at the Domesday Survey (A.D. 1086) the number of burgesses was only about half the number in the Confessor's time. Henry I. granted the citizens a charter (A.D. 1122), and soon after this the Flemings began to settle here, and introduced the worsted manufacture. The castle remained (except for a short interval in the reign of Stephen) in the hands of the Bigod family, until the reign of Henry III. Hugh Bigod, being in the interest of young Henry, son of Henry II., took the city by assault (A.D. 1174), with the aid of a body of Flemish troops. Henry II., to reward the loyalty of the citizens who had resisted this attack, restored or confirmed their privileges by a charter which is still extant, and which is one of the oldest in the kingdom. In the time of King John, Roger Bigod having joined the insurgent barons, Norwich Castle was seized by the king. Soon after John's death it was taken by the dauphin Louis, but on the peace which followed his departure, it was restored to the Bigod family, by one of whom, about A.D. 1224, the castle was surrendered to the crown. It was subsequently committed to the charge of the sheriff of Norfolk and Suffolk. In the early part of the same reign (A.D. 1220) the citizens had received authority to fortify their city, but they did not act on the permission till long after (A.D. 1294), and the fortifications were not fully completed till above a century afterwards; and in the mean time, in 1267, the insurgent barons took and plundered the place and did great damage. The walls of the city were embattled, with twelve gates and forty towers. In 1272 great disturbances broke out between the monks and clergy and the citizens, in consequence of the disputed jurisdiction of part of the city, and on account of these disturbances several citizens were executed, and the city for awhile lost its charter. In the reign of Edward III. the Flemings settled here in considerable numbers, and carried on the worsted manufacture. In the reign of Richard II. (A.D. 1381) the popular tumults which agitated nearly the whole country broke out in Norfolk, and the mob entering Norwich, and being headed by John the Litester, or Dyer, committed great outrages, until they retired to North Walsham, on the approach of Henry Spencer, the warlike bishop of Norwich. [NORFOLK.] In A.D. 1403 Henry IV. separated the city of Norwich from the county of Norfolk, and made it a county of itself. During the subsequent reigns the city does not seem to have advanced in prosperity, and in the reign of Edward VI. (A.D. 1549) it suffered from the rebels under Ket, the tanner of Wymondham. [NORFOLK.] In the earlier years of Elizabeth's reign the Flemings, who fled from the persecutions of the duke of Alva, settled at Norwich to the number of 4000, and much increased the prosperity of the town by the introduction of the bombazine manufacture. In the civil war of Charles I. Norwich sided with the parliament; and as the king had no party in this district, no contest took place. No public event of interest has occurred since that period.

The county of the city of Norwich extends about four miles from north to south, and as many from east to west; the town itself is not exactly in the centre of this district, but rather to the north-east, and extends about a mile and a half in length from north-west to south-east, and from three-quarters of a mile to a mile in breadth. It is of irregular form, and very irregularly laid out. The streets are narrow and winding; some of them follow the line of the antient walls, which are partly standing, though the ditches have been filled up and the gates pulled down. Those parts of the walls which remain are in very dilapidated condition; in other parts they have been entirely demolished and the site built upon. The town stands on a considerable space of ground for its population, the houses being much intermixed with gardens, so that it has been designated 'a city in an orchard.' The market-place is one of the most spacious in England. The streets are paved, lighted with gas, and watched under the provisions of a local act, and the principal streets have flagged footpaths. Many of the houses and other premises are well built; the best are in the market-place and its vicinity; those situated in the precincts of the cathedral are large and handsome, and are chiefly occupied as private residences. The increase of buildings has been of late years very considerable, principally on the west side of the town. The modern parts are well built. The river Wensum enters Norwich on the north-west side, and winds partly through, partly round the town, until it finally leaves it on the south-east side: it is crossed by at least ten bridges in the town or close to it. The county of the city contains forty-four parishes or hamlets, and part of a forty-fifth (Sprowston); of these, thirty-three are entirely comprehended in the town; the remaining twelve are partly or altogether in the rural portion of the county.

The most interesting of the public buildings are the castle and the cathedral. The site of the former was probably occupied by the castle of the East Anglian kings: it is a natural eminence, augmented perhaps by the earth thrown out from the excavations made at or preliminary to its re-erection by the Normans. The antient and present state of this castle was described by Mr. Wilkins of Norwich (*Archæologia*, vol. xii., pp. 145, et seq.), A.D. 1795, and more recently (A. D. 1834) by Mr. J. W. Robberds, also of Norwich. It had three nearly circular concentric lines of defence, each consisting of a wall and ditch, enclosing a ballium or court: beside these there were the keep, the only part now standing, in the innermost ballium; and a barbican, or outwork, to defend the entrance. The whole comprehended an area of not less than twenty-three acres. The outer ditch has been filled up from time immemorial, but some faint traces may yet be observed at some points. The middle ditch was more recently levelled, and the traces of it remain in the descent of 18 or 20 feet in some private yards. (Wilkins.) The inner ditch and the bridge over it still remain: the ditch is enclosed by an iron palisade, and planted with ornamental shrubs and trees, in the midst of which stands a newly-erected shire-hall, in the Tudor style. The bridge is 150 feet long, and has one arch of 40 feet span (or 43 feet, Wilkins): it is supposed to be the largest and most perfect arch remaining of what has been popularly but erroneously termed Saxon architecture. The wall of the innermost ballium has been long destroyed, but there are the remains of two round towers, part of the original gateway at the inner end of the bridge. The area of the inner ballium is level, but, from its superior elevation, commands an interesting view of the city and surrounding country. Round its verge there is a public walk, at the foot of a modern wall, faced with granite and capped with battlements of freestone, which, except where interrupted by the keep, encloses the central part of the area. In this central part is the keep, a substantial quadrangular building, the western and southern sides of which are upon the line of the enclosing wall, and are consequently open to the public walk. The keep is 110 feet 3 inches from east to west, including a small tower, through which was the principal entrance: from north to south it is 92 feet 10 inches: its height to the battlements is 69 feet 6 inches. The interior

comprehended two floors, a basement 24 feet high, with walls in one part 13 feet thick, faced with flint, and almost destitute of ornament. The upper part is faced externally with stone, and is much ornamented. The building maintains its antient form externally, but the architectural ornaments are much impaired by time: the inner part has been so much altered, in order to adapt it to the purpose of a gaol, to which it has been long applied, that the original arrangement of the apartments can scarcely be traced. The entrance tower, of richly ornamented Norman architecture, known as Bigod's Tower, has lately been restored. The eastern front has also been renovated, but is partly hidden by the incongruous addition of a modern county gaol. Mr. Wilkins ascribes the erection of the keep to the Anglo-Danish king Canute; but later writers, on better ground, ascribe it to Roger Bigod.

The foundation of the cathedral was laid, A.D. 1094, by Herbert Losinga, or Lozinga, the bishop in whose time the see was removed from Thetford to Norwich; but he finished only the choir and tower: succeeding bishops added the other parts of the building: the spire was added by Bishop Percy, A.D. 1361. Lozinga laid the foundations of a Benedictine monastery at the same time as those of the cathedral; the monks of this monastery were engaged in frequent contests with the citizens, and in these conflicts the cathedral received considerable damage. The monastery was completed in 1101: its revenues at the dissolution were 1050*l.* 17*s.* 6*d.* gross, or 978*l.* 19*s.* 4*d.* clear. A few traces of the buildings remain.

The cathedral consists of a nave with side-aisles, two transepts without aisles or columns, a choir occupying part of the nave and the area under the tower, an unoccupied space east of the choir, a chancel with two side-aisles continued round the circular east end of the choir, several chapels, a tower and spire at the intersection of the transepts with the nave, and a cloister, nearly perfect, on the south side of the church. The length of the whole building from east to west is 411 feet; the breadth at the transepts 191 feet; the breadth of the nave and side-aisles is 71 feet. The cloisters, with the included space, form a quadrangle with the sides not quite parallel, but averaging between 175 and 176 feet each. The height of the tower and spire, with the weathercock, is 313 feet. The plan is almost wholly Norman; the east end and some of the chapels are circular. Compared with some other cathedrals, that of Norwich is small in size and meagre in embellishment, but it comprises many forms and features of singular and unique character. There has been a lady-chapel eastward, but it is now destroyed. The exterior of the cathedral in many parts presents a decayed appearance, from the loose and friable character of the stone of which it was built; and buildings or other incumbrances prevent it from being seen to advantage on any side except the west. The nave, central tower, and eastern portion present a continued line of Norman work of excellent character: the east end is a very fine composition: in its aisles are some good Norman groined roofs; and the tower, both inside and outside, presents one of the best specimens of ornamented Norman extant. The architecture of the nave is very bold, and the arches of the triforium are very large. There are various insertions of later styles: the destroyed lady-chapel was of early English; the spire is of decorated English or early perpendicular; the cloisters present a series of work from early decorated to perpendicular, and a considerable portion of the west front is of perpendicular character. There is a fine font, and various portions of the screen-work and several of the monuments deserve attention. The chapter-house has been destroyed. There is a good doorway, and some lavatories of good work in the cloisters.

On the north side of the cathedral and connected with it is the episcopal palace, a large and irregular edifice, built by different prelates; there are in the garden some remains of the antient hall of the palace, now in ruins. Near the west end of the cathedral is the free school (formerly the charnel-house), containing some good antient work; and not far off are two antient gates, St. Ethelbert's Gate, of decorated English character, and the Erpingham Gate, of late perpendicular; both valuable specimens of their respective styles.

The parish churches of Norwich are more numerous than in any other city in England except the metropolis; they amount to thirty-six. Some of them are valuable specimens of antient architecture. Those of St. Bennet, St. Ethelred, and St. Julian have round towers: these towers are usually considered to be of early Norman date, but their original openings have been so disturbed by alteration, that their period and style cannot be exactly ascertained. Several of the other churches retain portions of good antient work amidst much mutilation and addition. The church of St. Michael Coslany is of mixed character; part is early English and part of perpendicular character; in the latter the tracery mouldings and other embellishments are carved in stone, and the interstices filled up with flints. The churches of St. Andrew, St. George Colegate, St. Giles, St. John Sepulchre, St. Lawrence, St. Michael at Plea, St. Saviour, and St. Stephen are all handsome churches, of perpendicular character, some of them with lofty and elegant flint and stone towers. But the most conspicuous church is that of St. Peter Mancroft, a large and fine perpendicular church, with a lofty tower and handsome windows. There are some other buildings which are the remains of ecclesiastical edifices. The nave of the church belonging to the monastery of the Dominican or Black Friars is now the common hall of the city, called St. Andrew's Hall; the choir, long used as the Dutch or Walloon church, with the convent kitchen, dormitory, infirmary, and other parts, were lately used as a workhouse. St. Giles's Hospital (popularly the Old Man's Hospital) comprehends portions of the antient church of St. Helen's. There are numerous dissenting places of worship.

The Guildhall is a large old building, erected in the fifteenth or sixteenth century, and since repaired or altered; it includes convenient courts for holding the city assizes and sessions, and contains some good paintings and some other articles of interest. The new city gaol is a massive and appropriate building; there is also a bridewell; the shire-hall, in the castle ditch, is a brick building in the Tudor style, cased with cement; the new county gaol, in connexion with the castle, is a commodious building.

The following shows the increase of the population of the county of the city of Norwich in the course of the present century:—1801, 36,832; 1811, 37,256; 1821, 50,288; 1831, 61,116. The population in 1831 comprehended 529 families, chiefly engaged in agriculture, 9153 in trade and manufactures, and 4848 not included in either of the above classes. The number of houses in 1835 was 14,201, of which 13,132 were inhabited and 1069 uninhabited. The number of houses rated to the poor was 4525, of which 1271 were rated under 10*l.* a year; 1978 above 10*l.* and under 20*l.*; 768 above 20*l.* and under 40*l.*; and 508 at 40*l.* and upward. The most important trade of the town consists of the manufacture of silk and worsted into shawls, crapes, bombazines, damasks, camlets, and imitations of the Irish and French stuffs. These manufactures are chiefly carried on by hand-looms and at the habitations of the workmen. There are however some manufactories. These branches of industry have recovered of late years from the depression under which they had long laboured (of which depression 1811 was the middle point): nearly 3800 adult males were engaged in them in 1831. There are three yearly fairs, and two weekly markets, viz. on Wednesday and Saturday; the latter, which is the principal, is a great market for corn and cattle. The corn-market is held in a large handsome building, 'the Corn Exchange,' erected for the purpose, and the cattle-market is in an open area adjacent to the castle. Trade in agricultural produce, coal, and other heavy goods is carried on by means of the river, chiefly in lighters of from fifteen to twenty tons burden. Since the 30th September, 1833, Norwich has been accessible to sea-borne vessels of small tonnage. To facilitate the approach, an entrance has been made from the sea into the navigable channel of the Waveney, by Lake Lothing, and a ship-canal from the Waveney to the Yare or Wensom. There is another short canal near Norwich. These various cuts with the river are navigable for vessels not exceeding ten feet draught of water. The harbour, lock, and sluice at the sea entrance of this navigation are extensive works. The assizes and quarter-sessions for the county o. Norfolk are held at Norwich.

Norwich claims to be a borough of prescriptive origin. The corporation has however received many charters from successive kings. Before the late Municipal Reform Act it comprehended a governing body of a mayor, 24 aldermen, and 60 common councilmen, with the usual officers, and nearly 3500 freemen. By the Municipal Reform Act the borough was divided into eight wards, and has 16 aldermen and 48 councillors. The city has returned

two members to parliament from the time of Edward I. The constituency in 1835-36 comprehended 4102 electors, freemen or 10*l.*-householders. The limits of the borough, both for municipal and parliamentary purposes, comprehend the county of the city, and have been no further altered than by the addition of some extra-parochial districts within the boundary. Norwich is the principal place of election and a polling-station for the eastern division of the county of Norfolk.

The benefices in the city amount to thirty-four: they are, with one exception, in the archdeaconry of Norwich, and are all small, only two exceeding 200*l.* yearly value; a very few are provided with glebe-houses.

There were in 1833, in the county of the city, thirty-eight infant or dame schools, with above 900 children; twelve boarding-schools, with above 300 children; and one hundred and twenty day-schools of all kinds (including national and other charity schools), with 5200 scholars; giving in all one hundred and seventy schools, with about 6400 children in them, or about one-tenth of the population of the county of the city at the time. There were forty-four Sunday-schools of all classes, giving instruction to about 4400 children.

There are several dissenting places of worship. The charitable institutions and charities are very numerous. (*Reports of Charity Commissioners.*) The Norfolk and Norwich Hospital, a large and elegant building of red brick, erected in 1771, can receive above a hundred patients. It is partly supported by a triennial musical festival in St. Andrew's Hall. The Norfolk and Norwich Lunatic Asylum is at Thorpe, about two miles from the city. There are a dispensary, an eye-infirmary, a lunatic hospital, an asylum and school for the blind, and several hospitals or almshouses for the indigent: St. Giles's hospital, the Boys' and Girls' hospitals, and Doughty's hospital are the chief of these. St. Giles's hospital (of which the management is in the corporation) has estates worth nearly 6000*l.* a year. There are a master and 165 inmates, besides servants. The free grammar-school is maintained out of this endowment.

Of institutions for the promotion of knowledge, the Norfolk and Norwich Literary Institution is the chief. It has a valuable well-selected library, for which a fine new building has been erected or is now erecting. The Norfolk and Norwich Museum is kept in the building connected with this institution, but is an entirely separate establishment. There is an annual exhibition of paintings by a society of artists. There are two newspapers published at Norwich. The Norwich Union Fire and Life Insurance Offices are institutions of considerable importance.

(Rickman's *Gothic Architecture*; *General History of the County of Norfolk*, Norwich, 1829; Stark and Robberds' *Scenery on the Rivers of Norfolk*; Britton's *Norwich Cathedral* and *Architectural Antiquities*; *Parliamentary Papers*.)

NORWICH, DIOCESE OF. Upon the establishment of Christianity among the East Angles, in the reign of Sigebert, Felix, a Burgundian (ob. A.D. 647), was made the bishop of the newly-converted people, and the see was fixed at Dunmoc or Dunmok, now Dunwich, then an important town, and perhaps the residence of the king. The limits of the diocese appear to have been those of the kingdom; and these may be considered as on the whole indicated by those of the present diocese, making some allowance for the variation which may be supposed to have taken place in the course of many centuries. The subsequent changes of the diocese are noticed elsewhere. [NORFOLK.]

The diocese includes the counties of Norfolk and Suffolk, except four parishes in the latter county, viz. Hadleigh, Monks Illeigh, and Moulton, peculiars of Canterbury, and Freckingham, a peculiar of Rochester; it comprehends also sixteen parishes in the county of Cambridgeshire, which appear to have belonged to the East Anglian kingdom, while the rest of that county belonged to Mercia, and is now included in the diocese of Ely.

There was formerly but one archdeaconry for the whole diocese; there are now four, as follows,—Norwich (the original one), Norfolk (established A.D. 1200), Sudbury (A.D. 1126), and Suffolk (A.D. 1127). These four comprehend 46 rural deaneries and 1356 parishes.

It is proposed by the Church Commissioners (Third Report) to transfer the Cambridgeshire parishes, with the deanery of Fincham, in the archdeaconry and county of Norfolk, the deanery of Lynn, in the archdeaconry of Norwich and county of Norfolk, and the deaneries of Fordham, Clare, and Thingo, in the archdeaconry of Sudbury and counties of Cambridgeshire and Suffolk, to the diocese of Ely. The revenues of the bishopric were formerly very considerable, but were much diminished by Henry VIII. The net yearly income of the see was, in 1831, 5395*l.* No alteration has been proposed in the income. The bishops have always possessed greater liberties than any other bishops in England, and they sit in the Upper House not only in right of their barony, but also as titular abbots of St. Bennet in Holme. The bishop of Norwich is the only abbot in England.

The corporation of the cathedral consists of a dean and six prebendaries; there are also six minor canons (three of whom hold respectively the offices of precentor, sacrist, and librarian), a gospeller, and an epistoller. The net revenue of the church, in 1831, was 5245*l.*, of which the greater part was shared among the dean and prebendaries.

NORWICH, AMERICA. [CONNECTICUT.]

NORWOOD, RICHARD, a mathematician of the earlier part of the seventeenth century, of whose personal history we know nothing. He is principally famous for having been one of the first who measured a degree of the meridian with any accuracy. His method was this:—in the year 1635 he measured the distance between London and York, taking the bearings as he proceeded along the road, and reducing all to the direction of the meridian and to the horizontal plane. The difference of latitude he found by observation of the solstices to be 2° 58′, and from that and his measured distance he concluded the degree to be 367,176 feet English, or 57,800 toises. This has been found to be a near approximation, but his method was necessarily not capable of much accuracy, nor did he measure the distance in the best manner: 'Sometimes,' says he, 'I measured, sometimes I *paced*, and I believe I am within a scantling of the truth.' He is the author of the following works:—1. 'Trigonometry, or the Doctrine of Triangles,' 4to., 1631, 1685; 12mo. 1661, 1667, 1669. 2. 'Fortification, or Architecture Militaire,' 4to., 1639. 3. 'The Seaman's Practice, containing the Mensuration of a Degree of the Earth,' 4to., 1637, 1655, 1667, 1668, 1678. 4. 'Epitome: being the application of the doctrine of triangles in certain problems concerning the use of the plain Sea Chart,' 8vo., 1674. 5. 'Logarithmic Tables,' 12mo., n. d. He also published letters and papers, in the 'Philosophical Transactions,' on the tides, on his mensuration of an arc of the meridian, and on other subjects of minor importance.

NOSE is one of the external apertures of the respiratory system and the organ for the sense of smell. The portion of the nose by which odours are perceived lies deep back in the cavity to which the external apertures of the nostrils lead; the portion which is prominent upon the face serves merely as the apparatus for inhaling the air which is impregnated with the odour. The most essential parts of the organ are the olfactory nerves, which come off from the olfactory bulbs of the brain [BRAIN], and passing through numerous holes in the ethmoid bone, which is situated between the orbits and above and behind the nostrils, ramify on the extended surfaces of that bone and the turbinated bones which form on each side the chambers of the nose. The sensitive terminations of the nerves are placed on the surface of a delicate and very vascular membrane which lines the whole cavity of the nose, and which is constantly kept moist by the secretion of a small quantity of mucus, in which the odoriferous particles are caught and for a time retained.

The sense of smell varies considerably, both in degree and in kind, in different animals. It is evidently possessed by insects and many others of the lower animals, but the organs by which they exercise it are unknown. In the higher animals its degree of acuteness is in general marked by the extent of surface of the ethmoid and turbinated bones, over which the olfactory nerves are distributed. In man this surface is proportionally smaller than in other animals, in most of which, besides occupying the greater part of the interior of the face, it is increased by peculiar branchings and convolutions of the thin layers of the bones. Each species has also a sense of smell in some degree peculiar to itself; thus herbivorous animals, though possessing the most delicate power of discerning the differences of vegetable odours, have no evident faculty of discriminating those of most animal substances; while the carnivora, on the other hand, can scarcely distinguish any others than the last. Each species has a fine sensibility for those sub-

stances which are of the greatest importance to its own existence, and thus obtains at once a knowledge of their presence in places concealed from all the other senses. Man possesses the sense of smell for a very large number of substances, but not in a very acute degree for any of them. The difference appears the greater between him and other animals in consequence of the neglect of the exercise of this sense which is common (except for particular purposes) in civilised society; but the American Indians and some of the northern Asiatic tribes, by their constant practice in hunting, are said to have acquired a power of scent scarcely inferior to that of the dog.

The olfactory nerve is appropriated exclusively to the sense of smell, and is incapable of perceiving pain or any other sensation. Of the peculiarities by which in different animals it is capable of perceiving only certain odours, we know no more than of the nature of those odours themselves, of whose existence we have no other evidence than that of the sense which they affect.

The sense of smell serves as an adjunct to that of taste, and is subservient in most instances to the same purpose, of providing proper and avoiding injurious food for the sustenance of the body. By it many animals seek out their food, and all select from that which they obtain; and much of that compound sensation which we regard as taste is really due to the smell, as, for instance, the sensation of the flavour of aromatic substances, which is completely lost by closing the nostrils while we are eating them.

For the full perception of odours it is necessary that the particles charged with them should be drawn with some force into the nose, and we may stand for some time in a very strongly smelling atmosphere without perceiving it, if we breathe only through the mouth. The most acute sensation is obtained by the sudden inhalation of a large quantity, or by a succession of short and quick inspirations.

NOSTRADA'MUS, or NOTRE DAME, MICHEL, a singular personage, who appears to have enjoyed some reputation as a physician, but is now only remembered as the author of the most celebrated predictions published in modern times, was descended from a noble* family in Provence, and was born at St. Rémy, a small town in the diocese of Avignon, on the 14th of December, 1503. His father was a public notary; his paternal grandfather was astronomer and physician to Réné, count of Provence and titular king of Sicily and Jerusalem; and his maternal grandfather (from whom he acquired the elements of the sciences and mathematics) was also astronomer and physician to John duke of Calabria, the son of king Réné. After having finished his courses of humanity and philosophy at Avignon, he went to study medicine at Montpellier, but was driven away by the plague in 1522. For more than four years he travelled about in the south of France, and stayed some time at Toulouse and Bordeaux, during which period he seems to have paid particular attention to botany, and also to have undertaken the treatment of all such patients as were willing to put themselves under his care. He then returned to Montpellier, took the degree of doctor of medicine in his twenty-seventh year (1529), and then again proceeded on his travels. At Agen he remained four years, and married. Here too he became acquainted with Julius Cæsar Scaliger, with whom he appears to have been intimate, and whom he calls a Virgil in poetry, a Cicero in eloquence, and a Galen in medicine; and declares that he owed more of his scientific attainments to him than to any other person. After the death of his wife and two children whom he had by her, he left Agen, and went first to Marseille, and then (in 1544) to Salon, where he married a second time.

Two years afterwards, the plague having broken out at Aix, he was invited thither by a public deputation from the inhabitants, and was of so much service (particularly by means of a powder of his own invention, of which he has given the formula in the eighth chapter of his treatise 'Des Fards'), that he received a pension from the town during several years after the cessation of the disease. He has left upon record a curious instance of the modesty of the women of Aix, who, as soon as they perceived themselves attacked by the contagion, began to sew themselves up in their winding-sheets, in order that their naked bodies might not be seen after their death.

The next year (1547) he was sent for to Lyon on a similar occasion, and appears to have succeeded equally well. On his return to Salon, where he was less esteemed than elsewhere, he employed part of his leisure time in composing some medical works, chiefly consisting of receipts and preparations. It was about this time that he first began to represent himself as divinely inspired, and endued with the gift of prophecy. His predictions were first written in prose; but, upon revising them afterwards, he thought they would look better if expressed in verse, and accordingly he threw them all into the form of quatrains, and then arranged them in three Centuries. When this was done, he was in some doubt about the safety and propriety of publishing the work; but as the time of many of the events foretold in his predictions was near at hand, he at last resolved to print them. The first edition was published at Lyon (1555), and appeared with a dedication to his son Cæsar, then an infant. As might be expected, the work was very differently received by different persons; at home he was generally considered an impostor, but in other parts of France he was looked upon either as a person really and truly inspired by God, or else as one who held communication with the devil. However Henry II. and his superstitious mother Catherine sent for him to Paris, received him at court very graciously, made him a present of two hundred crowns, and sent him to Blois to see the king's children there, and to try to find out their future destinies. The result of this visit is not known, but it is certain that Nostradamus returned to Salon loaded with honours and presents. Encouraged by his success, he increased his quatrains to the number of a complete thousand, and published a new edition of them, with a dedication to the king, in 1558. The next year that prince received a wound at a tournament, of which he died, and it was thought that so unusual an accident could not have been omitted in Nostradamus's predictions; accordingly his book was immediately consulted, and in the thirty-fifth quatrain of the first century were found the following lines:—

'Le lion jeune le vieux surmontera,
En champ bellique par singulier duel
Dans cage d'or les yeux lui crevera.
Deux plaies une, puis mourir; mort cruelle.'

So remarkable a coincidence greatly increased his fame, and he was honoured shortly after with a visit from Emanuel duke of Savoy, and his wife the princess Margaret of France. Charles IX., on a progress through Provence, sent for him, and upon his complaining of the slight respect in which he was held by his fellow-townsmen, publicly declared that he should hold the enemies of Nostradamus to be his own. He afterwards presented him with a purse of two hundred crowns, together with a brevet constituting him his physician in ordinary, with the same appointment as the rest.

Nostradamus died about sixteen months after, July 2, 1566. He was buried at Salon, in the church of the Cordeliers, under a monument inscribed with an epitaph asserting in the most confident terms his prophetic skill. After his death two more Centuries were collected from his papers, &c., and added to his quatrains, and the whole work was translated into various foreign languages. Since that time his pretensions to the gift of prophecy have been variously estimated; most persons probably consider him to have been either an impostor or a lunatic, and attribute the fulfilment of some of his predictions to chance; others have accused him of magic, from which charge he is defended by Naudé, in his 'Apologie pour les grands Hommes soupçonnés de Magie;' while some of the believers in animal magnetism have classed him among other 'crisiaques' who exercised 'la faculté physique de prévision somnambulique et de prévoyance ou clairvoyance instinctive.' (*Archives du Magnétisme Animal*, t. viii.)

Even in 1806 there appeared at Paris a work by Théodore Bouys, with the following singular title: 'Nouvelles Considérations sur Nostradamus et sur ses Prédictions concernant: 1, la Mort de Charles I., Roi d'Angleterre; 2, celle du Duc de Montmorency, sous Louis XIII.; 3, la Persecution contre l'Eglise Chrétienne en 1792; 4, la Mort de Louis XVI., celle de la Reine, et du Dauphin; 5, l'Elévation de Napoleon Buonaparte à l'Empire de France; 6, la Longueur de son Règne; 7, la Paix qu'il doit procurer à tout le Continent; 8, sa puissance, qui doit être un jour aussi grande sur mer qu'elle l'est actuellement sur terre

* According to some authorities he was of Jewish descent, and his biographers, after deciding that he was of the tribe of Issachar, applied to him the following words from 1 Chron., xii. 32—'Of the children of Issachar were men that had understanding of the times, to know what Israel ought to do.' ('Archives du Magnétisme Animal,' t. viii.)

9, enfin, la Conquête que ce Héros doit faire de l'Angleterre.' The (so called) prediction of the death of Charles I., mentioned in the above title-page, is one of the most singular in the whole collection; it occurs in the forty-ninth quatrain of the ninth century, and is as follows:

> 'Gand et Bruxelles marcheront contre Anvers;
> Sénat de Londres mettront à mort leur Roi;
> Le sel et le vin lui seront à l'envers;
> Pour eux avoir le règne en désarroi.'

In the dedication of his work to Henry II. he predicts that the Christian church will suffer from a cruel persecution: 'et durera ceste cy jusques à l'an mille sept cent nonante deux, *que l'on cuidera estre une renovation de siècle*:" the latter part of this sentence is certainly remarkable when we recollect that the French republic dated its existence from September 22, 1792; and that in all public acts time was reckoned from that day as from the commencement of a new æra.

The 'Centuries' of Nostradamus have been frequently reprinted, and numerous commentators have endeavoured to explain his predictions. The best editions are those of Lyon, 1568, 8vo., and Amsterd., 1668, 12mo. Of Commentaries (besides that of M. Bouys, already noticed) the most celebrated are: 'Commentaire sur les Centuries de Nostradamus,' par Chavigny, Paris, 1596, 8vo.; 'Concordance des Prophéties de Nostradamus avec l'Histoire,' par Guynaud, Paris, 1693, 12mo.; 'La Clef de Nostradamus,' par un Solitaire, Paris, 1710, 12mo., and an English translation, with notes, by Theophilus de Garencières, Lond., fol. 1672.

Before he wrote his 'Centuries' Nostradamus had published during several years an almanac, containing predictions about the weather, &c., besides a few other works, of which only the names are now remembered: 'Traité des Fardements,' Lyon, 1552; 'Des Confitures,' Anvers, 1557; both contained in 'Opuscule de plusieurs exquises Receptes, divisé en deux parties,' Lyon, 1572, 16mo.; 'Le Remède très utile contre la Peste et toutes Fièvres pestilentielles,' Paris, 1561, 8vo.; 'Paraphrase de Galien, sur l'Exhortation de Ménodote aux Etudes des Beaux Arts,' Lyon, 1588, 8vo.

For more particulars of the life and works of Nostradamus see 'Abrégé de la Vie de Michel Nostradamus, par Palamède Trone de Condroulet, de la Ville de Salon,' 4to., no date; his 'Life,' by Haitze, Aix, 1712, 12mo. Adelung has given him a place in his 'Histoire de la Folie Humaine,' vii. 105.

This article cannot better end than with the famous Latin distich composed on his name, which has been attributed to Jodelle and to Beza:—

> 'Nostra damus, cùm falsa damus, nam fallere nostrum est;
> Et cùm falsa damus, nil nisi nostra damus.'

NOTA'MIA. Dr. Fleming gives this name to a group of the great genus Sertularia of Linnæus. [CELLARIÆA.]

NOTARY. This word is derived from the Roman name *notarius*, a person who was so called from his taking down in notes or writing (notæ) the words of a speaker. The *notarii* were in fact short-hand writers, and it is clear from many passages of antient writers that they used symbols of abbreviation. It may be sufficient to quote the two following passages:—

> 'Hic et scriptor erit felix cui litera verbum est,
> Quique notis linguam superet cursumque loquentis,
> Excipiens longas nova per compendia voces.'
> Manilius, *Astronom.*

> 'Currant verba licet, manus est velocior illis,
> Nondum lingua suum, dextra peregit opus.'
> Martial, *Epig.*, xii. 208.

It seems that they were also employed to take down a man's will in writing. The notarii were often slaves. The word is also sometimes used to designate a secretary to the princeps or emperor. (Ausonius, *Epig.*, 136; Gregor. Nazianz., in the letter inscribed τῷ Νοταρίῳ; Augustin, lib. ii., 'De Doctrina Christiana;' *Dig.* 29, tit. 1, sec. 40; Lampridius, *Alex. Sev.*, 28; see also the references in Facciolati., *Notarius.*)

In the fourth century, the notarii were called Exceptores, and were employed by the governors of the Roman provinces to draw up public documents. But the persons mentioned under the later Roman law, who corresponded most nearly to the modern notary, are called tabelliones; their business was generally to draw up contracts, wills, and other instruments. The forty-fourth Novel treats specially of the tabelliones (περὶ τῶν συμβολαιογράφων); and they are spoken of in various other parts of the Novels, and in the Code. (*Cod.* xi., tit. 53, &c.) It appears clear that as the word notarius is the origin of the modern term notary, so the tabellio is the person from whom were derived the functions of the modern notary public.

It is impossible to say when persons under the name and exercising the functions of notaries were first known in England. Spelman cites some charters of Edward the Confessor as being executed for the king's chancellor by notaries. (*Gloss.* tit. *Notarius.*) 'Notaries,' are mentioned with 'procurators, attornies, executors, and maintainours,' in the stat. of 27 Edward III., c. 1. They were officers or ministers of the ecclesiastical courts, and may therefore have been introduced into this country at a very early period. It is generally supposed that the power of admitting notaries to practice was vested in the archbishop of Canterbury by the 25 Hen. VIII., c. 21, s. 4. The term of service and the manner of admission to practice are now regulated by the 41st Geo. III., c. 79, which prescribes that no person in England shall act as a public notary or do any notarial act unless he is duly sworn, admitted, and enrolled in the court wherein notaries have been accustomarily sworn, admitted, and enrolled. He must also have been bound by contract in writing, or by indenture of apprenticeship, to serve as a clerk or apprentice for seven years to a public notary, or to a scrivener using his art and mystery according to the privilege and custom of the city of London, and also being a notary, who has been duly sworn, admitted, and enrolled. An affidavit of the execution of the contract must also be made and filed, as the act prescribes, in the proper court, and the affidavit must be produced and read at the time of the person's admission and enrolment as a public notary, in the Court of Faculties, which is the proper court for admitting and enrolling notaries. The proper persons for taking and filing the affidavits are the master of the faculties of the archbishop of Canterbury, in London, his surrogates or commissioners. Persons who act as notaries for reward, without being properly admitted and enrolled, are liable for every offence to forfeit and pay the sum of 50*l.*; but British consuls abroad are empowered to perform notarial acts (6th Geo. IV., c. 87, s. 20). The licence or commission for acting as a notary in England requires a stamp duty of 30*l.*, and in Scotland one of 20*l.* The annual certificate is the same as for attorneys. By the 3rd and 4th William IV., c. 70, the provisions of the act of 41st Geo. III., so far as relates to the apprenticeship for seven years, are confined to the city of London and liberties of Westminster, the borough of Southwark, and the circuit of ten miles from the Royal Exchange in the city of London; and the master of the Court of Faculties of the archbishop of Canterbury is empowered to appoint, admit, and cause to be sworn and enrolled in the Court of Faculties any attorney, solicitor, or proctor, not residing within the above-mentioned limits, to be a notary public, to practise within any district in which the master of the faculties shall see good reason for making such appointment. Notaries public who practise within the jurisdiction of the incorporated company of Scriveners of London must become members of and take their freedom of that company under the act of the 41st Geo. III.

The original business of notaries was to make all kinds of legal instruments; they are often spoken of in former times as the persons who made wills (Shepherd's *Touchstone*, vol. ii., 407, Preston's ed.); but the attorney, solicitor, and conveyancer have now got possession of this part of their business. In practice their business is now limited to the attestation of deeds and writings for the purpose of making them authentic in other countries, but principally such as relate to mercantile transactions. It is also their business to make protests of bills of exchange. They also receive and take the affidavits of mariners and masters of ships. Notaries are mentioned with serjeants-at-law, barristers, solicitors, attorneys, and others (44th Geo. III., c. 98, s. 13), as the persons who may, for fee or reward, draw or prepare conveyances or deeds relating to real or personal estate, or proceedings in law or equity. A recent act (5th and 6th William IV., c. 70, s. 5) provides that in cases of such actions or suits being brought in any court of law or equity within any of the territories or dependencies of Great Britain abroad, as in the act mentioned, public notaries, with other persons named in the act, are authorised to receive solemn declarations in writing, in the form prescribed by the act; and such declarations, when certified under their signature and seal, and transmitted, shall be allowed in all such actions and suits to have the same force as if the persons making the declarations had appeared and sworn or affirmed the matters therein contained in open court, or

upon a commission issued for the examination of witnesses.

NOTARCHUS. [TECTIBRANCHIATA.]

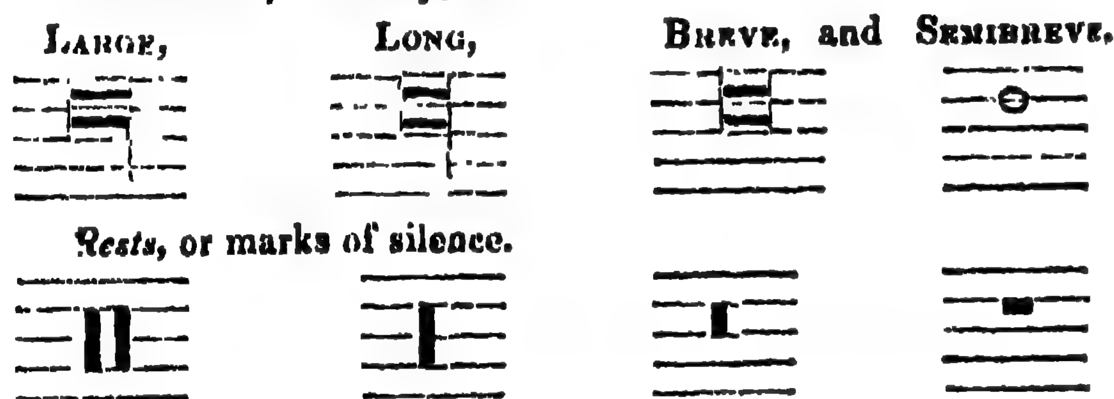
NOTATION. [SYMBOLS.]

NOTATION, in Music, signifies the method whereby the pitch, or tune, and duration of musical sounds are represented, and by which definite periods of silence, called *rests*, are marked:—it is to music what letters and punctuation are to language.

To show the pitch, the Greeks used the letters of their alphabet, placed in various positions. [MUSIC, p. 24.] The Romans had recourse to the majuscules of their own alphabet for the same purpose, till the latter part of the sixth century, when St. Gregory, or Pope Gregory I., employed the seven first capital Roman letters for the first septenary, beginning with the A answering to the lowest space in our base clef. For the next ascending septenary he used the corresponding small letters; and the third he denoted by the same small letters doubled. Example, explained in modern notation:—



Guido, early in the eleventh century, introduced, it is commonly supposed, the use of points instead of letters, which he placed on parallel lines, giving names to the latter by means of letters, which have since been gradually transformed into those signs called clefs. [GUIDO; GAMUT; CLEF.] The dots however of Guido only marked the degrees of high and low; to Franco of Cologne we are indebted for characters which at once denoted both the tune and time of the sounds. [MUSIC, page 26.] Of these he invented four, and their rests; namely, the



These were valued or measured by the semibreve. The breve was equal to two semibreves, the long to four, and the large to eight. [LONG, &c.] The invention of the Minim, Crotchet, Quaver, and Semiquaver, is ascribed to John de Muris, a doctor of the Sorbonne, who made this important addition to notation, and also originated certain characters determining the measure, in the year 1338. The Demisemiquaver first appeared in the seventeenth century, and, about the middle of the last, was divided into halves. Latterly it has been subdivided into quarters, and even into eighths, most unnecessarily, and greatly to the perplexity of the performer, and, consequently, to the detriment of the art, by wantonly, and with an affectation at once vulgar and mischievous, throwing difficulties in the way of its attainment.

We have not been able to ascertain at what time the sharp and flat were brought into use. The sharp was at first square in form, according to Butler (*Principles*, &c., 1636). The flat was always a small *b*. The natural is, comparatively, of modern date. Till towards the close of the seventeenth century, the secondary use of the sharp was to contradict the flat, and of the flat to contradict the sharp. The natural, introduced at nearly the same time, relieved the two other characters from part of their duty. In the printed score of Lully's opera, *Persée*, dated 1684, the natural does not appear; nor even in his *Armide*, published in 1710. In Purcell's *Diocletian* (1691) sharps and flats contradict each other; but the natural is occasionally used. [SHARP; FLAT; NATURAL.] The grouping of quavers, &c. by means of ligatures, or ties, joining the stems, is also one of the improvements made in the latter half of the seventeenth century. It does not seem to have been practised in 1653, when Lawes printed his 'Ayres,' &c. In Lully's *Proserpine* (1680) we find quavers tied at the bottom of their stems, in groups of four, but semiquavers are all detached. The use of bars became general about the middle of the seventeenth century, though this mode of division was partially adopted much earlier. [BAR; ABBREVIATIONS; DOT; NOTE; TIME.]

NOTE, in Music, a character which, by its place on the staff, represents a sound, and by its form determines the time or continuance of such sound. There are six notes in ordinary use,—the Semibreve, Minim, Crotchet, Quaver, Semiquaver, and Demisemiquaver. To these may be added the Breve, yet met with in sacred music; and the half-Demisemiquaver, much used, and often unnecessarily, by the moderns. [BREVE; SEMIBREVE, &c.] The value, or length in time, of the Semibreve may be considered as unity; the minim is $\frac{1}{2}$, the crotchet $\frac{1}{4}$; the quaver $\frac{1}{8}$; the semiquaver $\frac{1}{16}$, and the demisemiquaver $\frac{1}{32}$. Hence is formed the following *Table of Proportions*, as it is denominated:—

One Semibreve . . . . is equal to . . .
2 Minims . . . .
or
4 Crotchets
or
8 Quavers
or
16 Semiquavers
or
32 Demisemiquavers

And hence it will also appear, that one minim is equal to two crotchets, &c.; one crotchet, to two quavers, &c., &c.

The word NOTE is frequently used as a synonym of sound; thus we say a high, low, loud, or soft *note*; or, the *note* A; a flat *note*, &c. Some confusion occasionally arises out of this double meaning; but the musical nomenclature is very imperfect, and any attempt to improve this or any other branch of the art meets with little support from its professors.

NOTES, BANK. [BANK—BANKER—BANKING.]

NOTHING. In the article INFINITE will be found as much upon this word as will enable us to dispense with the consideration of the symbol 0 as the limit approached but never attained by the continual diminution of magnitude.

Among the terms used in mathematical language are *nothing*, *cipher*, and *zero*. The etymologies of the two latter terms are explained under those heads: their meanings are somewhat different. The first word, *nothing*, implies the absence of all magnitude, but its occurrence denotes either that magnitude did exist, or might have existed, or does exist under similar circumstances in other problems, or in the same problem under different points of view. Were it not for this, the word would be useless: thus we do not consider it necessary to speak of £20 generally as twenty pounds, no shillings, no pence, and no farthings. But if this £20 had been the amount of a number of sums, the symbol £20 0 0 would be useful as indicating that the results of an operation (addition) had left no quantities in places where beforehand quantity might have been expected. The term *unity* would have been useless in the same manner, except as a tacit reference to other units; anything we please is *one* of its kind, and accordingly the indefinite article (a or an), which is certainly *one* in etymology, has lost its definite monadic signification, because such signification is useless. This point is of some importance to the mathematician, as justifying a use of the symbol 0 where it might seem redundant. The 0 and 1 are frequently useful as symbols of distinction where they are not wanted as symbols of operation: in like manner, in common language, the simple phrase '*one* ox and *no* sheep,' though it implies no more of positive conception than the more simple phrase 'an ox,' may be a proper description where the second would be no such thing.

The *cipher* is 0 considered in a purely arithmetical point of view, as the mode of denoting a blank column intervening between or following columns which contain significant numbers.

The term *zero* considers 0 rather as a starting point of magnitude than as the symbol for the recognition of absence of all magnitude, and really denotes, not the entire absence of magnitude, but the arbitrary determination to reckon all magnitudes by their excess or defect from a certain zero magnitude. Thus the zero point of the thermometer does not mean that shown when there is no temperature, but a certain temperature, that of freezing water; and degrees above and below zero indicate excesses or defects of tempe

rature above or below that standard. It is then perfectly proper to say that ten degrees below zero is a lower temperature than five degrees, and that both are less than zero. Whenever magnitude is considered in connection with modifications, the zero and even the nothing of such magnitude may require to be considered with similar modifications, even though all absolute magnitude is lost. Straight lines, for example, admit of consideration with reference not only to their lengths, but also to their positions and directions. Let the straight lines diminish each by an approach of one extremity towards the other, and position and direction still always distinguish each line from the others, though all be of the same linear magnitude (length): when the one extremity actually reaches the other, length is destroyed, but one indication of position still remains, the fixed extremity, or what was the fixed extremity as long as the line has length. Different points (*nothings* of length) still tell something about the positions of the different lines which left them; and there are as many *nothings* of length (distinguishable) as there are different points in space. These zeros, as it might be proper to call them, are of most essential consequence, *as zeros*, in the complete method of connecting the explanations of symbols in algebra (in the widest sense of the term) with those of the restricted or arithmetical sense. [NEGATIVE QUANTITIES.] All direction however has disappeared when a line is reduced to a point; and considerations arising out of this, the principles of which appear in FRACTIONS, VANISHING, will be applied in the article TANGENT.

It might seem as if, in the consideration of the term *zero*, we had commenced an explanation of negative quantities, and had obtained a justification of the phrase *less than zero*, if not of *less than nothing*. This may be true to a certain extent, too limited however for the purposes of algebra, and not sufficiently expressive of the actual meaning of the words. When the distinction of positive and negative quantities is explained and adopted, the terms greater and less are no longer used in their simple arithmetical meaning, but take a wider signification, such as will allow old theorems of arithmetic to remain true under the same phraseology as before. After an express extension of signification has been accorded to these terms, it is not wonderful that uses of them should be perfectly allowable which could not be made if we retained the old significations. Those who use the extended meanings, without fully understanding and admitting them, will make a mystery of algebra: those who refuse to make the extensions, and yet charge others who do not refuse with falling into all the absurdities which extended uses without extended meanings present to *themselves*, are precisely in the condition of the honest tar who asserted that the French were such fools as not to know the difference between a cabbage and a shoe (*chou*). But those again who, professing to use extended meanings, do not take care to make their logic conformable to them, but neglect to distinguish between premises which are true of one set of meanings and not of the other, will fall into such mistakes as would be made by him who should conclude that blood is salt water, because both circulate in arms (of the human body and of the sea).

Admitting the scale of positive and negative numbers,

$$\ldots -3,\ -2,\ -1,\ 0,\ +1,\ +2,\ +3,\ \ldots$$

it is obvious that on the right of 0, on which we have quantities common to pure arithmetic and algebra, we pass from the greater to the less by moving our eyes from right to left; while on the left we have no meaning at all of greater and less yet established. Let us agree then that we are to pass from what we will call the greater to what we will call the less by passing from right to left in all cases; and there is no mystery in our meaning when we say that all negative quantities are less than 0, and that −10 is less than −4.

But is this convention a purely arbitrary one? We answer that it rather bears the character of interpretation [INTERPRETATION] than of convention. Having new modes of quantity, with corresponding extensions of addition and subtraction, we are rather to ask what greater and less *ought* to mean than what, with liberty of choice, we shall make them mean. The great characteristics of greater and less (or more and less) in arithmetic are, that the more you add the more you get, and that the more you take away the less you leave, and *vice versâ*. The preceding extensions of greater and less are the only ones which will allow of these theorems remaining universally true. Thus

$$3+(-5)=-2, \text{ add more, and } 3+(-4)=-1,$$

and −1 is greater than −2. Again,

$$-5-(-12)=7, \text{ subtract less, } -5-(-13)=8,$$

and 8 is greater than 7.

It is however to be remembered, though no rule has been laid down upon the subject, that it may be gathered from the practice of writers that the term *smaller* does not accompany *less* in its extended meaning. The former term is particularly used in the Differential Calculus to denote an approach to 0, which in a negative quantity is algebraic increase, and in a positive quantity diminution. And many, perhaps all writers on the Differential Calculus, are lax in their use of all the comparative terms, sometimes employing them in the algebraical and sometimes only in the arithmetical sense. The inconvenience is not very great, as a student must have learned to contend with greater difficulties than those of an unexplained use of dubious terms, before he is able to make his way to the higher mathematics. But it may be useful to give him a hint that, in reading works of analysis, he would do well at first always to stop for a moment when the word greater or less occurs, and ask himself whether the problem requires and allows the extended signification or not, and to make some mark of distinction in every place. This will at once ensure the soundness of the first reading, and facilitate the second.

NOTHING, DIFFERENCES OF. This name is given to certain numbers which are used in so many different theorems that it is worth while to tabulate them, and to consider them as fundamental numbers of reference. They were first specifically noted in this point of view by the late Bishop Brinckley. We shall here confine ourselves to a description of their derivation, an expeditious mode of calculating them, a table of some of their values, and one instance of their use.

If we take a series of terms a, b, c, e, &c., and form the successive differences of a [DIFFERENCES, CALCULUS OF], the symbols Δa, $\Delta^2 a$, &c., have a meaning which refers to the excess of b above a, &c. If then a should happen to be $=0$, the symbols $\Delta 0$, $\Delta^2 0$, &c., may stand for finite quantities for instance in—

$$\begin{array}{ccccl} 0 & & & & \\ & 2 & & & \\ 2 & & 1 & & \\ & 3 & & 0 & \\ 5 & & 1 & & \text{\&c.} \quad \Delta 0=2, \quad \Delta^2 0=1. \\ & 4 & & 0 & \\ 9 & & 1 & & \\ & 5 & & & \\ 14 & & & & \end{array}$$

But as the preceding series is a set of values of $\frac{1}{2}x(x+1)-1$, in which the first term is 0 ($x=1$ gives $\frac{1}{2}1.2-1$), it would be necessary in using several series beginning with 0, to make marks of distinction between $\Delta 0$ in one series, and that in another. The most useful case is that in which whole and positive powers of 0, 1, 2, 3, &c. form the series in question; thus if we take the series of cubes,

$$\begin{array}{rcccccl} 0^3= 0 & & & & & & \\ & 1 & & & & & \\ 1^3= 1 & & 6 & & & & \Delta.0^3=1 \\ & 7 & & 6 & & & \\ 2^3= 8 & & 12 & & 0 & & \Delta^2 0^3=6 \\ & 19 & & 6 & & & \\ 3^3= 27 & & 18 & & 0 & & \Delta^3 0^3=6 \\ & 37 & & 6 & & & \\ 4^3= 64 & & 24 & & & & \Delta^4 0^3=0, \text{ \&c.} \\ & 61 & & & & & \\ 5^3=125 & & & & & & \end{array}$$

The symbol $\Delta^m 0^n$, whenever m is greater than n, stands for 0; when m is $= n$ it stands for $1\times 2\times 3\times \ldots .\times n$. In all other cases the differences of 0^{n+1} may be found from those of 0^n by the following equation:—

$$\Delta^r 0^{n+1} = r\left\{\Delta^{r-1} 0^n + \Delta^r 0^n\right\}$$

It is frequently useful to have the term $\Delta^r . 0^n \div 1.2.3 \ldots (r-1).r$ arranged in tables. If we wish to make this separately, we have, denoting the preceding fraction by $\Delta^{(r)} . 0^n$

$$\Delta^{(r)} 0^{n+1} = \Delta^{(r-1)} 0^n + r\Delta^{(r)} 0^{n}$$

The following table contains both the differences, and the differences divided, as just explained, up to those formed from the series of tenth powers; arranged so that simple differences must be looked for above or on the dotted lines, and divided differences below the dotted lines; the first by means of the left hand column and highest row; the second by the right hand column and lowest row. Thus—

$$\Delta^5 0^8 = 126000 \quad , \quad \frac{\Delta^5 0^8}{2.3.4.5} = 1050$$

$$\Delta^6 0^7 = 15120 \quad , \quad \frac{\Delta^6 0^7}{2.3.4.5.6} = 21$$

n	Δ	Δ	Δ^3	Δ^4	Δ^5	Δ^6	Δ^7	Δ^8	Δ^9	Δ^{10}	n
10	1	1022	55980	818520	5103000	16435440	29685200	30240000	16329600	..3628800	1
9	1	510	18150	186480	834120	1905120	2328480	1451520	..362880	1	2
8	1	254	5796	40824	126000	191520	141120	...40320	3	1	3
7	1	126	1806	8400	16800	15120	...5040	6	7	1	4
6	1	62	540	1560	1800	720	10	25	15	1	5
5	1	30	150	240	120	15	65	90	31	1	6
4	1	14	36	24	21	140	350	301	63	1	7
3	1	6	6	28	266	1050	1701	966	127	1	8
2	1	...2	36	62	2646	6951	7770	3025	255	1	9
1	..1	45	750	880	22827	42525	34105	9330	511	1	10
n	Δ^{10}	Δ^9	Δ^8	Δ^7	Δ^6	Δ^5	Δ^4	Δ^3	Δ^2	Δ	n

The only one not in the table is $\Delta^{(r)} 0^r$ which is always unity.

The uses of these differences mainly consist in the rapidity with which transformations can be made by means of them, whether of a simple algebraical or of a trancendental kind: such as the following, n being a whole number:—

$$x^n = x + \Delta^{(2)} 0^n . x(x-1) + \Delta^{(3)} 0^n . x(x-1)(x-2), + \&c.$$

$$x^2 = x + x(x-1),$$
$$x^3 = x + 3x(x-1) + x(x-1)(x-2),$$
$$x^4 = x + 7x(x-1) + 6x(x-1)(x-2) + x(x-1)(x-2)(x-3),$$

and so on. [See also OPERATION, SERIES.]

The following works contain many properties of these numbers: Herschel, 'Examples of the Calculus of Finite Differences,' *passim*; and *Lib. Useful Knowl.*, 'Differential and Integral Calculus,' pp. 253-261, and 307-311.

NOTHU'RUS. [TETRAONIDÆ.]

NOTICE is a term used in English law with reference to various kinds of transactions. That use of it which is most important, and which it is here proposed to explain, has reference to contracts of buying and selling, and mainly so far as such contracts come under the cognizance of courts of equity. In this sense notice signifies the knowledge of a party to the contract of any fact which is connected with the contract, and may become a matter of dispute either between the parties to the contract, or between them or any of them and any other person not a party to that contract. The term notice is most commonly applied to buying and selling of land, or some interest in land, and the matter generally in dispute is, whether the interest of a person who is not a party to the contract is in any way to be affected by it.

Notice, in English law, is an ambiguous term, and has different meanings according as we contemplate the giver or the receiver of what is called notice. To give notice is to communicate something to another person: the person who receives the communication, is said *to have* notice, and when it is proved that he has had such notice, he is presumed to have knowledge of the thing communicated. Thus notice comes to have the meaning of *knowledge* when applied to him who is the receiver of the notice; and it is not always easy to avoid the ambiguity resulting from this double meaning of the word.

Notice of a fact (notice being here considered with reference to the receiver) may mean either knowledge of the fact itself, or knowledge of some other fact from which arises a legal presumption of knowledge of the fact itself. In both cases the knowledge must be proved by evidence, and the only difference in the evidence is this; in the former case a fact is to be proved, which fact, when proved, shall be considered knowledge; and in the second case a fact is to be proved, which cannot be considered as knowledge, but is a fact the establishment of which leads to a legal presumption, that is, to an inference of some fact which is considered as knowledge. If a man receive a written communication from another person of a certain demand upon him by such person, all that can be proved by evidence is that he did receive such communication; but that fact being established, all the world imputes to the receiver of such communication knowledge of the demand contained in it. The fact, in order to have any relation to the contract, must of course be such a fact as would affect the contract if it were expressly made part of it. A fact of this kind then being established, which is either knowledge or legal presumption of knowledge, the legal conclusion is, that the person who had such knowledge at the time of making the contract must be considered as having acquiesced in such fact; in other words, such fact must be considered to have the same effect as if it were expressed in and incorporated with the contract.

Notice has been divided by writers on English law into 'actual' and 'constructive.' 'Actual notice,' it is said, 'requires no definition;' and 'constructive notice, in its nature, is no more than evidence of notice, the presumptions of which are so violent that the court will not allow even of its being controverted, but it is difficult to say what will amount to constructive notice.' (Sugden's *Vendors and Purchasers*.) It is not stated by this writer what actual notice is, and since his remarks on constructive notice are equally applicable to actual notice, he has in fact made no distinction between the two kinds of notice. In addition to what has been said on the general subject of knowledge, we may take an instance of what would be called actual notice in English law. We will suppose this actual notice to be a statement in writing made by a person interested in a certain piece of land and in the course of the treaty for the purchase of it, and by him handed to the purchaser. Now it is obvious that all this, when proved, does not make the knowledge of the purchaser; but these facts, when proved, are evidence of knowledge, 'the presumptions of which are so violent' that the universal consent of mankind 'will not allow even of its being controverted.' There is then no further distinction between actual and constructive notice, considered as a matter belonging to the general subject of evidence, than what has been already stated; and the only question which can arise in any system of law is, what facts, not capable of being considered as knowledge, shall be considered, when proved, as leading to a legal presumption of such facts as may be considered knowledge.

These general principles will be better understood by their application to particular cases, in English law, of buying and selling land. But it should be premised that there are cases of what is often called notice, in English law, where no knowledge of anything is proved, but the existence of a certain thing is proved, and then notice is legally imputed to the person to be affected by it. Thus, when there is a public act of parliament, every body is legally supposed to have notice of it. But this is notice which arises from positive law, and is not presumed from the proved knowledge of another fact; it would therefore be more appropriate to give it some other name, and not to confound it, as some text writers do, with that which they call constructive notice. Another example of such notice made by positive law is, where there is a suit pending* which may affect the subject of sale; in this case the purchaser is also said to have notice of it, and he buys subject to what may be decreed in the suit. All conveyances by any bankrupt *bonâ fide* made and executed before the date and issuing of the fiat are valid, notwithstanding any prior act of bankruptcy committed by the bankrupt, provided the person to whom the conveyance is made had not at the time of such conveyance notice of any prior act of bankruptcy committed by the bankrupt.

Where facts are proved to be known to a man which are sufficient to make him inquire further, he is considered to know all that he might have known if he had made inquiry. For instance, if a man buys an estate which is in the possession of a tenant, notice of such possession is notice of any lease or other interest which the tenant may have in the estate; and though the seller may affect to sell the complete and immediate interest in the estate, the buyer will

* By a recent Act, 2 Vic., c. 11, purchasers and mortgagees are not to be bound by *lis pendens*, of which they have not express notice, unless the names, &c. of the parties to be affected thereby, are registered, as the act prescribes.

take it subject to the interest of the tenant. And if a tenant under a lease has some further interest in the land by agreement posterior to the date of the lease, the buyer of the land, who has notice of the tenant's possession, has constructive notice of such agreement, and therefore he buys the estate subject to all the tenant's rights. It will of course be observed that the contract of a purchaser with a seller cannot affect the previous contract, about the same land, of another person with the same seller, so far as the mutual rights and liabilities of the seller and that other person are concerned. But the question between the two persons who have dealt with the seller is, Which of the two is to have that thing which he has agreed to buy, and which of the two is to have the trouble of settling the dispute with the seller. It is determined that the subsequent contractor, who has what is called notice of the former contract, must be considered as having the benefit of his own contract, but still subject to the prior contract; and if he has bought the estate and obtained a conveyance of it, having notice of a prior contract for sale, he will be compelled to convey the estate to the person who had such prior contract with the vendor. If the prior contractor has obtained any legal estate in the land, the buyer, of course, whether he has notice or not, only obtains from the vendor such interest as he can sell.

That which is notice to a man's agent is notice to himself, provided the agent has the notice in the transaction in which he acts as agent. This doctrine is obviously founded on the legal identity of the principal and agent, in all matters which the principal transacts by his agent.

It seems to be determined that the mere fact of a man being witness to the execution of a deed, will not be notice to him of the contents of the deed; for the nature of that transaction called witnessing a deed is not in any way connected with a knowledge of the contents of the deed.

Sometimes a person who is entitled to a sum of money or the interest of a sum of money which is in the hands of a trustee, will fraudulently sell his interest twice over. A second purchaser, who *has* no notice of the former transaction, and *gives* notice, that is, communicates in a way that cannot be misunderstood the fact of his purchase to the trustee before the former purchaser does, is entitled to have what he has bought, in preference to the other purchaser. By *not having* notice, he purchases a good title, and acquires a right to what he has bought, equal to the first purchaser's right; by *giving* notice, he secures that which he has purchased. This is a good example of Notice, viewed under two different aspects, which should not be confounded.

Other examples of notice may be found in the text books.

It will be collected from what has been said, that cases of this kind of notice under consideration, are cases in which three persons at least are generally concerned, a seller, a buyer, and some person who is interested in disputing the buyer's title to the thing which he has bought. The term is also applied, though less frequently, to the case of a seller and buyer only; for that which may be called notice in the other case may be equally well called notice in this. The seller may not intend to conceal or misrepresent any fact, and he may think that he has said everything that was necessary, and the buyer may think that he was buying the whole of an estate when the vendor was only selling the estate subject to certain encumbrances; and the state of facts may be such as would be evidence of notice to the purchaser as against a party who had contracted with the vendor previous to himself. The question then comes, whether such state of facts is to be considered as notice to the purchaser, in the case now supposed, as against the vendor, and equally binding on him as it would be in the case of a prior contracting purchaser. It may be observed that the doctrine of notice, as between a seller and a single buyer, has been applied to the case of a lease, where it was held that notice of a lease to a purchaser was notice of its contents; but this doctrine was derived from a case wherein three parties were concerned, a seller, a lessee, and a purchaser, and it does not appear to have been considered that the question of notice between two purchasers, or two parties claiming an interest in land against a third person, is not quite the same thing as the case of a dispute between two persons only, a seller and a buyer. (*Hall* v. *Smith*, 14 Ve., 426, 437.) This kind of question however, in English law, would be more properly considered under the heads of Concealment, Suppression, or Mispresentation, which are a species of fraud; or under the head of Mistake.

The question of notice is one of great practical importance. So far as relates to what shall be evidence of notice, it will vary greatly in different systems of jurisprudence; so far as concerns its true nature, it belongs to the general doctrine of contracts.

Notice, in English law, as relates to buying and selling of land, is treated by Sugden, in his 'Vendors and Purchasers,' but in a very unsatisfactory way, so far as concerns the general principles of notice. Notice in other cases, as in Bills of Exchange, Distress, &c., is mentioned under those heads.

NOTION, NOTIONAL. The word notional has been used by Dr. Becker, in his 'German Grammar,' in a sense which it may be useful to explain. He divides all the words of which language consists into notional words and signs of relation. By notional words he understands those which express notions, that is, things which are the objects of the understanding, such as are expressed by the words usually called verbs, nouns, and adjectives. By signs of relation he understands such as merely express a relation between the different things, the objects of the understanding, which are expressed by notional words. The signs of relation are either mere terminations, that is, final letters which modify the form of the notional word, or they are separate words, which he calls relational words. In the phrases, 'the dog barks,' 'my father's falling house,' the *s*, *'s*, and *ing*, are respectively terminations which indicate a relation between the things expressed in the several phrases. In the phrases, 'he lives *in* a town,' 'he left us *after* dinner,' *in* and *after* are relational words, that is, they connect the notions expressed by 'his living,' and 'his leaving,' respectively with the notions of 'town' and 'dinner.' Thus we may consider Notional words as the matter of language, and Relational words as giving to language its form, that is, what is commonly called its grammatical structure. It must be observed however that in many languages which possess few terminations, a considerable part of the relations which subsist among words, that is, among the notions which words express, are indicated by the order of the notional words as well as by signs of relation. This is true to some extent in all languages, but it is more particularly the case in such languages as our own.

This grammatical division of words adopted by Dr. Becker leads to the division of grammar into two main parts, etymology and syntax, the former of which respects the forms of the several words, and the latter their relations when combined in a sentence.

A notional word may either be a root or element incapable of further analysis, or it may be a form derived from such a root, as *grow*, *growth*, *long*, *length*, where the *th* is not a termination, in the sense of a sign of relation, but is a termination which modifies the notion of the word from which it is formed. A notional word may also be what Dr. Becker calls a Secondary Form, as *greatness*, *wealthy*, &c., the latter of which words exhibits the following process of development: *weal* (German, *wohl*), *wealth*, *wealthy*.

It is not intended by this division of words to affirm that some of such terminations as *ness*, &c. may not have been originally notional words. It is probable that all such terminations, and perhaps all terminations, have once been notional words, and that in the progress of usage they have become permanently attached to particular words, of which they may now for all purposes, except historical purposes, be considered a part, that is, a part necessary to give the word that meaning which it now has. Nor is it intended to affirm that words which are now merely words of relation, were not originally notional words: on the contrary, Dr. Becker admits that most of the relational words 'are derived from radical verbs, and therefore were originally notional words; they have now come to imply merely relations of notions, and do not differ in their present signification from the terminations of inflection. The use of Relational words increases in language in the same proportion as the power of inflection diminishes.'

This division of words into Notional and Relational appears to be of considerable importance. Some question however may arise whether all the words which Dr. Becker calls relational are properly placed by him in that class. Thus he considers the pronoun I as a word of relation merely, and implying *personality*. But this does not appear to us to be a correct view of the nature of that word. Interjections, he also observes, 'imply neither notions nor relations of notions, and are not necessarily connected with

the sentence;' but the latter part of this proposition may be assented to without giving our assent to the former part.

NOTRE DAME. [PARIS.]

NOTTINGHAM, EARL OF. HENEAGE FINCH, whose father was recorder of the city of London, and a member of the family of the earls of Winchelsea, was born in 1621. He was educated at Westminster school, and was afterwards removed to Christ Church, Oxford. After leaving the university he became a member of the Society of the Inner Temple, London. On the restoration of Charles II. he was appointed solicitor-general, and distinguished himself in the prosecution of the regicides. He published 'An exact and most impartial Account of the Indictment, Arraignment, Trial, and Judgment of (according to law) Twenty-nine Regicides,' 4to., 1660; 8vo., 1679. In 1661 he was made member of parliament for the university of Oxford, and about the same time was created a baronet. In 1665 the diploma of LL.D. was presented to him by the university of Oxford. He took a prominent part in the impeachment of the earl of Clarendon in 1667; and in 1670 was appointed attorney-general. He succeeded the earl of Shaftesbury as lord-keeper of the great seal in 1673, and in 1675 was made lord-chancellor of England. He presided as lord high steward on the trial of Viscount Stafford, in 1680, and pronounced judgment against that nobleman in a speech of extraordinary eloquence. He was created earl of Nottingham in 1681, and died in 1682.

Besides the account of the trial of the Regicides, he published 'Speeches in both Houses of Parliament,' 1679: 'Speech at the Sentence of William Viscount Stafford,' 1680: 'Arguments upon the Decree in the Cause between the Hon. Charles Howard, Esq., Plaintiff; Henry, late duke of Norfolk; Henry, lord Mowbray, his son; Henry, marquis of Dorchester; and Richard Marriot, Esq., Defendants; wherein the several ways and methods of limiting a trust of a term for years, are fully debated,' Lond., 1685, fol.: 'An argument of the Claim of the Crown to Pardon on Impeachment,' fol.; and 8vo., 1791: there is a volume of 'Reports of Cases decreed in the High Court of Chancery during the time Sir Heneage Finch, afterwards earl of Nottingham, was Lord Chancellor,' 1725. Some valuable Chancery Reports, written with his own hand, were left by him. Lord Nottingham had a high reputation for sound judgment and integrity. It has been said of him, 'That he was a man of probity and well versed in the laws, an incorrupt judge, and in his own court could resist the strongest application even from the king himself.' 'He was,' says the anonymous author of the 'Lives of the Lord Chancellors,' 'a very eloquent person, and a most excellent orator, and a lord of that wisdom, that some have stiled him the English Roscius, the English Cicero, &c.' His character is drawn by Dryden, in his 'Absalom and Achitophel,' under the name of Amri—

'To whom the double blessing does belong,
With Moses' inspiration, Aaron's tongue.'

NOTTINGHAM. [NOTTINGHAMSHIRE.]

NOTTINGHAMSHIRE, an inland county of England. It is bounded on the north-east and east by Lincolnshire, from which it is in one part separated by the river Trent; on the south-east and south by Leicestershire, from which it is separated in one part by the Soar; on the west by Derbyshire, from which it is separated in one part by the Erewash; and on the north-west by Yorkshire. Its form approximates to an oval. Its greatest length is from north by east to south by west, from the junction of the three counties of York, Lincoln, and Nottingham, to the village of Stanford on the Soar, 51 miles; its greatest breadth, from the border of Derbyshire between Mansfield and Alfreton, to the river Witham on the Lincolnshire border, not far from Newark, 26 miles. Its area is estimated at 837 square miles. The population in 1821 was 186,873; in 1831, 225,327; showing an increase in ten years of 38,454, or 20 per cent.; and giving 269 inhabitants to a square mile. In size it is the twenty-seventh of English counties; in amount of population, the twenty-second; and in density of population, the tenth. Nottingham, the capital, is near the Trent, 109 miles in a direct line north-north-west of London, or 124 miles by the mail-road through Woburn, Newport Pagnell, Harborough, Leicester, and Loughborough.

Surface; Geological Character; Hydrography; and Communications.—The surface of the county is undulating, except in the vale of Trent and the vale of Belvoir; but there are no very high hills. The northern boundary runs through the marshes that surround the Isle of Axholme. The east side of the county between the Witham and the Trent is for the most part flat. Beacon hill rises to the east of Newark: and a ridge of upland skirts the immediate valley of the Trent from the neighbourhood of Newark to Nottingham. The eastern side of this ridge has a very gradual slope toward the vale of Belvoir, watered by the Deven and its tributary the Smite. Quite in the south part of the county, between the Trent and the vale of Belvoir, are the Wold Hills, in which are included the Hotchley or Leak hills. On the west side of the Trent the ground rises gradually towards the Idle in the north west and the Erewash in the south-west. The western escarpment which skirts the valley of the Idle is steeper: and it may be observed of the hills generally in this county, that their western slope is steeper than the eastern. Pear-tree hill and Gringley hill (235 feet) are at the northern end of these uplands, just above the Idle, and Langton Harbour and Holland Hill (467 feet high) are between the Trent and the Erewash. West of the Idle the ground rises again, but it is intersected by the valleys through which the tributaries of the Idle flow. Near the head of the Maun, one of these tributaries, are the high lands of Shirewood or Sherwood Forest, known in tradition as the principal haunt of Robin Hood. Sutton-in-Ashfield hill, west of Mansfield, is about 600 feet high.

The strata which occupy the surface of this county succeed each other in order from east to west. The eastern and south-eastern border of the county is chiefly occupied by the lias, which is found in that part of the vale of Belvoir which lies east of the Deven and the Smite, and, passing to the west of the latter river near its source, forms the Wold hills of Nottinghamshire and Leicestershire. The vale of Trent and the uplands to the west of it are for the most part composed of rocks of the red-marl or new red sandstone group. In the northern part of the county these formations extend to the borders of Yorkshire and Derbyshire. Just along the northern border they sink beneath the fens surrounding the Isle of Axholme, in which isle they emerge again. Langton Harbour and Holland Hill belong to this formation. The striking colour of the red-marl has given origin to many local names, as Retford on the Idle, Radford, Radcliffe, and Ratcliffe, and perhaps Ruddington, all in the neighbourhood of the Trent, and not far from Nottingham. Among the beds of this formation is a sandstone so soft as to admit of being easily excavated. The caverns near Nottingham are supposed to have given to that town (and through it to the county) its name, Snodengaham, 'the home of caverns.' There are under that town many caves, some of them cellars of comparatively modern date, but others of considerable though unascertained antiquity. There are some caverns in the face of a cliff near the river Lene, west of Nottingham castle; and there are some remarkable excavations at Sneinton close to Nottingham. These are all probably artificial, or, if originating in natural caverns, have been enlarged and modified by human labour. Gypsum occurs plentifully in this formation, and is quarried in several places. The newer magnesian or conglomerate limestone underlies the red-marl; but in some parts these formations are separated by beds of quartzose gravel, extending to the depth of 600 or 900 feet, and often consolidated into a soft pudding-stone, of which the Castle hill at Nottingham is a specimen. 'Although this gravel has been referred by some to a recent alluvial origin, it seems more probable that it is a form of the conglomerate rocks so generally attendant upon this formation. It constitutes the prevailing stratum throughout Sherwood Forest.' (Conybeare and Phillips's *Outlines of the Geology of England and Wales.*)

The beds of the magnesian limestone occupy a tract varying from 4 to 7 miles wide in the south-western part of the county, west of a line drawn from Mansfield to Nottingham. Near Mansfield the strata are arched and contorted. West of the magnesian limestone occurs the great coal-field of South Yorkshire, Derbyshire, and Nottinghamshire, of which coal field only a small part is comprehended in this county. Between Mansfield and Nottingham the limestone immediately overlies the coal, but south-west of Nottingham the coal-measures crop out from beneath the red-marl which occupies the valley of the Trent. There are many coal-pits in the county which yield abundance of coal. The general direction of the dip of the coal-beds is eastward. The seams of coal vary from one or two to five or six feet

in thickness. The quality of the coal is similar to that of Newcastle, but rather inferior.

Blue limestone, approaching to marble in texture, is quarried in the lias of Beacon hill near Newark. Good bluish stone for building is dug at Maplebeck, between Mansfield and Newark; and there are quarries of gypsum and of a reddish stone sufficiently hard for building, or suited for burning into lime, at Gotham; both in the red-marl district. There are extensive quarries of reddish stone, from which immense blocks are raised, near Mansfield, near the boundary of the red-marl and the magnesian limestone. A quarry of the limestone at Mansfield Woodhouse is worked for lime: its beauty of colour and closeness of grain would render it more valuable than Portland stone, were it not for its extreme hardness. Coarse paving-stone, much used at Nottingham, is quarried at Linby, north of that town, in the magnesian limestone district.

Hydrography, Communications, &c.—The whole county belongs to the basin of the Trent, which river first touches the south-west border of the county at the junction of the Soar, flows along the border about 3 miles to the junction of the Erewash, and then entering the county flows through it 25 miles in a north-east direction to the neighbourhood of Newark: below Newark it turns to the north, and flowing first within and then upon the border of the county 25 miles farther, to below Gainsborough (Lincolnshire), finally quits the county and flows through the marshes of the Isle of Axholme to the Humber. That part of its course which appertains to this county is about 53 miles. It is a broad river, bordered by a belt of low lands, and navigable throughout for river craft, and up to Gainsborough for sea-borne vessels of 200 tons. There was not till lately any bridge over the Trent between Newark and Gainsborough, which towns are 21 miles distant. Recently a cast-iron bridge, of four arches, each 118 feet span, has been thrown over the river at Dunham. The total length of the bridge is 536 feet.

The Idle is formed by the junction of several streams. The Rainworth Water rises in Sherwood Forest 3 miles south of Mansfield, and flows north east 12 miles to the town of Ollerton. Here it is joined on the left bank by the Maun, which rises at the village of Hardwick, and flows north-east 12 miles by Mansfield and through Clipstone park. From Ollerton the united stream, bearing the name of Maun, flows 4 miles north by east till it is joined on the left bank by the Meden, which rises at Whiteborough on the border of the county, 2 or 3 miles west of Mansfield, and flows 16 miles north-east by Church Wartop, and through Thoresby park. The river now takes the name of Idle, and flows north-east 4 miles to the neighbourhood of West Drayton, where it receives on the left bank the Wollen or Wallin, 17 miles long. This river rises in Derbyshire, and flows through the park of Welbeck abbey, where it expands into a large sheet of water, and then, after its junction with the Poulter (7 miles long), which also rises in Derbyshire, flows through Clumber park, where it again expands. From the junction of the Wallin, the Idle flows northward in a winding course of 18 miles to Bawtry, receiving on the left bank, just above that town, the Rayton or Ryton, 24 miles long, which rises in Yorkshire, and flows by Worksop and Blyth. After receiving the Ryton, the Idle flows eastward 2 miles to the border of Lincolnshire, and 7 miles more along the border, or just within it, into the Trent at West Stockwith. Below Bawtry its course is through the marshes of 'the Car,' south of the Island of Axholme. In this part it is called the Bicar Dyke, Bykersdyke, or Vicardyke, while the name of the New Idle is given to a straight navigable cut which runs north through the marshes of Thorne level into the lower part of the Trent. [Axholme, Isle of; Lincolnshire.] The whole course of the Idle, measured from the head of the Rainworth Water, the Maun, or the Meden, into the Trent at West Stockwith, is about 47 miles. It is navigable from East Retford, 12 miles above Bawtry. None of its tributaries are navigable.

The Soar has about 8 miles of its course, navigable throughout, on the border of this county and Leicestershire, to which latter it belongs. [Leicestershire.] The Erewash rises in the county, very near the head of the Maun, and flows south-west to the border, and south-south-east along the border of this county and Derbyshire to its junction with the Trent. The Lene rises near the grounds of Newstead Abbey, 5 miles south of Mansfield, and flows 12 or 13 miles southward into the Trent near Nottingham; it passes through Newstead park, and close to the town of Nottingham. The Dover Beck rises in Sherwood Forest, and flows 10 miles south-east into the Trent. The Deven rises in Leicestershire and flows northward into the Trent through the vale of Belvoir. Of its whole course of more than 20 miles, 8 or 9 belong to this county. Its tributary the Smite, 18 miles long, and the Whipling, 10 miles long, which flows into the Smite, belong chiefly to this county. The tongue of land at the junction of the Deven and the Trent is insulated by a navigable channel communicating between these two rivers. [Newark.]

Those parts of the Erewash and Cromford canals which are on the east side of the Erewash belong to Nottinghamshire. [Derbyshire.]

The Nottingham Canal commences in the Cromford Canal at Langley Bridge, and runs in an irregular line south-east into the river Trent at Trent Bridge near Nottingham. It has a cut from above Nottingham into the river Trent at Beeston, higher up. The Act for this canal was obtained in 1792, and the canal completed in 1802.

The Grantham Canal commences at the town of Grantham in Lincolnshire, and pursues a very circuitous course for more than 30 miles to the Trent bridge near Nottingham, close to the place where the Nottingham Canal enters the Trent. It is partly in Lincolnshire, partly in Leicestershire, and partly in Nottinghamshire. The Acts for it were obtained in 1793 and 1797: the navigation is now complete between Grantham and Nottingham; but a short cut from the main line to Bingham is still unfinished.

The Chesterfield Canal commences in the Trent near West Stockwith, and runs south-west round the base of Gringley Beacon to East Retford; and from thence westward by Worksop, and thence again south-west through Yorkshire and Derbyshire to Chesterfield. In the Yorkshire part is a tunnel more than 1½ miles long; and near Gringley Beacon is another tunnel 153 yards long. This canal was commenced under an Act obtained in 1771, and was finished in 1776 or 1777. From the Trent to Retford it will receive boats of 50 or 60 tons burthen; in other parts, only of 20 tons. From the Trent to Worksop is a rise of 250 feet, and to the summit-level is a total rise of 335 feet.

The principal coach-roads are as follows:—the Carlisle and Wetherby mail-road enters the county 10 miles beyond Grantham in Lincolnshire, and 120 miles from Hicks's Hall, London; it passes through Newark (124 miles), Ollerton (137 miles), and Worksop (146 miles), into Yorkshire. The Edinburgh and York mail-road branches off from the last at Newark, and runs through Tuxford (137½ miles), East Retford (145 miles), and Bawtry (153 miles), which last is just within the border of Yorkshire. The Halifax mail-road enters the county at Rempston, 4½ miles beyond Loughborough in Leicestershire, and 113½ from London, and passes through Nottingham (124 miles), and Mansfield (138 miles) into Derbyshire. The Leeds mail-road enters the county at Upper Broughton, 6½ miles beyond Melton Mowbray in Leicestershire, and runs to Nottingham, where it falls in with the Halifax road.

The Mansfield and Pinxton railway runs from the town of Mansfield to the Cromford Canal at Pinxton mills, near Alfreton in Derbyshire, with a branch to the Codnor Park iron-works. This railway is above 8 miles long; at its commencement at Mansfield it is 101 feet 8 inches above the level of the Cromford Canal at Pinxton: its terminus at Pinxton is 8 feet above the canal. The Act for this railway was obtained A.D. 1817. It is chiefly used for conveying coal and lime. Branches of the Midland Counties Railway connect the London and Birmingham railway at Rugby with the towns of Leicester, Derby, and Nottingham; and the last two with each other. These branches follow the valleys of the Soar, the Derwent, and the Trent. A railway has been projected from Nottingham to Lincoln, there to join the proposed Great Northern Railway.

Agriculture.—The climate of this county is dry and healthy, and upon some of the light lands the harvest is as early as in many counties more to the south. The face of the country is undulating without rising to any great height. The high hills of Derbyshire intercept the westerly winds, and cause the clouds to discharge their moisture before they reach Nottinghamshire: the heaviest rains are when the wind comes from the east.

The county may be divided into three districts with respect to soil. In the first, sand and gravel prevail. This extends along the vale of Trent to the borders of Lincolnshire, and to the north of Nottingham along the antient forest-land and border, in a strip of land about 30 miles

long and from 7 to 10 miles broad. The next is the clay, which lies between the Trent land and the last-mentioned strip, and in a part of the southern extremity of the county towards Leicestershire. The third district is that where limestone and coal are found. This lies partly on the borders of Derbyshire, and partly on the south-east, towards Leicestershire and Lincolnshire. Gypsum of an excellent quality is found on Beacon Hill, near Newark, and at Red Hill, at the junction of the Trent and Soar.

This county, of which a great portion was once forest-land, contains many fine parks and seats. In consequence of this many domains are held in hand by wealthy proprietors, and the buildings attached to these estates are substantial and convenient. An improved state of agriculture also results from this circumstance, and crops may be seen which, to a superficial observer, might appear to proceed from a much richer soil than it is in reality. There are, no doubt, many fertile spots; but the generality of the lands are not above mediocrity, and some are very poor. The farms are of moderate size, and the tenants are mostly at will, trusting to the honour of their landlords not to remove them without sufficient cause, nor to raise the rents beyond a fair rate. The same families have continued in some farms for generations.

The old plough of the county is a swing-plough, but wheel-ploughs have been introduced, and are very generally used. The other agricultural implements are such as are used in the adjoining counties; and the increased means of communication have brought every improved instrument, such as cultivators, scarifiers, and drills, into partial use. The gentlemen's bailiffs, as everywhere else, are ready to try new inventions. The old farmers are cautious, and wait till they are satisfied of their utility, which they are often slow in acknowledging.

Before the enclosure of the forest-lands and the commutation of the forestal rights, a great portion of the land could not be cultivated to advantage or improved. The practice of leaving the land in grass for several years, and then breaking it up for a course of cropping, prevailed in most parts of the county, and being better regulated, has introduced a modified convertible system, to which the lighter soils are well adapted. Turnips are cultivated to a great extent. Along the river Trent are some very good meadows and pastures, in which bullocks are grazed to advantage. The breeds which are preferred are the Hereford and the short-horn for the best pastures, and the small Scots for inferior. There are not many dairies, although some good cheese is made here and there. The dairies are chiefly along the Soar. The sheep are mostly of the Leicester breed. Some South-downs are however met with on many farms.

Before the common fields were enclosed and divided, the system of cultivation on the clay soil was very imperfect. A fallow, often not half cleaned, and but slightly manured, was followed by a crop of wheat, which was thought abundant if it reached three-quarters per acre, and moderately good, at little more than two. Beans and peas mixed together often followed; and, in spite of sowing thick, which produced straw and little corn, the weeds were not kept down: and the crop of oats which followed was generally half smothered with weeds, which the next fallow could not eradicate. Now a better system has succeeded; and although the fallow is thought absolutely indispensable, yet the tillage is better, the crops cleaner, and the produce more abundant.

There are many hop plantations in the county, which, in some years, give a good profit to the grower. There are excellent market-gardens in the neighbourhood of Newark, Nottingham, and other towns, the sandy soil being very favourable to the cultivation of roots and vegetables. There are some good orchards on the heavier soils, but no cider is made in the county.

The remains of the old forest-trees are still to be met with in parks, where they have been preserved as ornaments; but they have been greatly thinned in the woods which still remain. A better system of forest management has been introduced of late years, and more attention is paid to the growth of navy timber. Many new woods and plantations have been made in those parts of the forests which have been granted to individuals, or allotted on enclosures. Very extensive woods have been planted on the estates of the dukes of Newcastle and Portland.

The principal fairs in Nottinghamshire are as follows:—Nottingham, March 7, April 2, October 3; Newark, Friday before the Sunday-fortnight before Easter, May 14, Whit-Tuesday, August 2, November 1, Monday before December 11; Mansfield, April 5, July 10, second Thursday in October; Warsop, May 21, November 17; Edwinstow, October 24; Worksop, March 31, October 15; Tuxford, September 25, hops; Retford, April 2, October 2, hops.

Divisions, Towns, &c.—Nottinghamshire is divided into six wapentakes and one liberty, beside the county of the town of Nottingham. The relative situation, &c. of these divisions is as follows:—

Name of Division.	Situation.	Area.	Population in 1831
Bassetlaw wapentake:—			
Hatfield division	N.W.	111,220	19,461
North Clay division	N.E.	35,230	10,295
South Clay division	E.	38,080	7,496
Bingham wapentake	S.E.	55,760	12,442
Broxtow do.	W.	81,470	65,299
Newark do.	E.	41,910	17,111
Rushcliffe do.	S.	41,570	10,920
Southwell and Scrooby liberty	various parts	46,200	11,051
Thurgarton wapentake	Central	71,750	20,572
Nottingham town and county of town		2,610	50,680
		525,800	225,327

Each of the wapentakes consists of a north and a south division, except Bassetlaw, which has three divisions, as given above. The liberty of Southwell consists of parishes scattered through the different hundreds.

The county contains the county and corporate town of Nottingham, the borough and market towns of Newark and East Retford, and the market-towns of Bingham, Mansfield, Ollerton, Southwell, Tuxford, and Worksop. Bingham (pop. 1738), Mansfield (pop. 9426), Newark (pop. 9557), and Retford (East) (pop. 2491), are described elsewhere; of the others we subjoin an account.

Nottingham is locally situated in the southern division of Broxtow hundred, on the north bank of the river Lene, about a mile north of the Trent. The borough constituted a county of itself, and comprehended, before the new arrangement of the municipal boundaries, an area (as above) of 2610 acres, with a population of 50,680: the additions lately made, pursuant to the recommendation of the Municipal Boundary Commissioners, may be considered as having raised the area to more than 4000 acres, and the population (calculated on the census of 1831) to more than 60,000, which now probably amounts to 70,000.

The early history of this place is involved in great obscurity. The excavations from which it is said to have gained its name (in Saxon) Snotenga-ham, or Snotinga-ham, which some interpret 'the home of caverns'), are supposed to have had a British origin; and Gale contended for placing here the Roman station Causennæ or Causennis, which however others place at Ancaster in Lincolnshire. Nottingham was included in the kingdom of Mercia: it was taken by the Danes, to whom it was confirmed by the treaty between Alfred and Guthrum (A.D. 878 or 880): it was one of their Mercian burghs which connected their Northumbrian and East Anglian dominions. It was taken and fortified by Edward the Elder, but the Danes afterwards regained and held it until they were conquered by Edmund I. (A.D. 942). William the Conqueror built a castle here, the government of which he conferred on his natural son William Peverel. In the troubles of Stephen's reign the town was taken and burnt by the partisans of the empress Maud; and it suffered a similar fate either in the later troubles of the same reign, or in the rebellion of prince Henry, son of Henry II., against his father. In the troubles of the reign of Richard I. the castle, which was of great strength, was the object of contest; in those of the reign of John it was held throughout by the king. The seizure of Roger Mortimer, the paramour of queen Isabella, in Nottingham castle (A.D. 1330), is an incident well known. In the civil war of Charles I., that king set up his standard at Nottingham (August, 1642), but the place came next year into the hands of the parliament, who garrisoned the castle, of which Colonel Hutchinson (whom the 'Memoirs' of his lady have made so well known) was governor. During the Protectorate the castle was dismantled; and after the Restoration the old building was replaced by the present one, which has nothing of a castle but the name. The only occurrences of any importance since have been the 'Luddite'

disturbances in 1811-12, and the riot arising out of the political excitement of 1831, on which occasion the castle was burnt by the rioters.

The town is on a considerable slope on the north bank of the Lene, commanding an extensive view of the vale of Trent. It consists of a number of streets irregularly laid out but remarkably well paved. Those in the central and more antient parts of the town are narrow; but considerable improvements have been effected of late years; the streets of modern erection are broader, and there are several ranges of good buildings. The castle is on a rock at the south-west corner of the town, overlooking the Lene. The market-place is one of the largest and finest in the kingdom, surrounded with lofty buildings. The extension of the town has been checked by the right of common over the land to the north and south of it possessed by the freemen. This has led to the formation of groups of houses of considerable extent in the neighbouring parishes of Sneinton, Lenton, and Radford, which may be regarded as suburbs of Nottingham, and have been by the late alteration included in the municipal limits. These outlying portions have a population of more than 20,000. There are several bridges in the town over the arms of the Lene or over the Nottingham canal; and about a mile south of the town is 'Trent Bridge' of nineteen arches over the Trent, a very antient structure, and exhibiting, from frequent repairs, great architectural variety: connected with this bridge are a causeway over the meadows and an embankment to protect the lower part of the town in the time of floods. The Trent is here about 200 feet wide. The environs of Nottingham are very pleasant.

Among the principal buildings are 'the New Exchange' at the east end of the market-place, a brick building erected early in the last century, and repaired and beautified in 1814. The lower part is appropriated to shops, behind which are the shambles; the upper part contains a suite of noble rooms for the transaction of public business or for assemblies. The county-hall, rebuilt A.D. 1770, is a commodious and handsome building, with two convenient courts, and apartments for the judges, jury, &c. The town-hall is a spacious edifice, of which the town gaol forms the ground-floor. There are a small plain theatre; a grand stand on the race-course, which is to the north of the town, and is one of the finest in the kingdom; extensive cavalry barracks in the castle park; and a building erected as a riding-house for the yeomanry, and now used as a circus or for other public amusements.

The borough before its late enlargement comprehended the three parishes of St. Mary, St. Peter, and St. Nicholas. St. Mary's church is in the central part of the town. It is a large cross-church, with a fine tower at the intersection of the transepts, rising two stages above the roof of the church, crowned with a battlement and eight crocketted pinnacles. The western end of the church has been modernised, but in very bad taste; the rest is of perpendicular character, and presents several peculiar features: it has a very large proportion of window light, perhaps greater than any other church in England. The interior is good, and contains some fine monuments. St. Peter's church is near the market-place. It is a large church, originally of perpendicular character, but the greater part has been modernised. It has a plain western tower, surmounted by a lofty octangular crocketed spire. St. Nicholas's church is in Castlegate-street, near the castle: it is a plain brick building, with stone quoins and cornices, erected in the latter end of the seventeenth century, in place of one pulled down during the civil war of Charles I. St. James's church or chapel is on Standard hill, in the extra-parochial district of the park: it is a neat modern edifice of perpendicular character, with a low embattled tower. St. Paul's chapel, in St. Mary's parish, is a modern Grecian building with a Doric portico. The church at Lenton is very small; it was built after the dissolution of the religious houses, but some portions of a more antient building appear to have been employed in its erection. Radford and Sneinton churches are both small: the latter stands on the summit of an excavated rock, and commands an extensive view. A grant for a new church in Sneinton parish has been made by the commissioners for the erection of new churches. There are several dissenting places of worship in Nottingham, especially for Wesleyan Methodists, Independents, and Baptists. The Catholics, Jews, Quakers, Unitarians, and several other sects have each their place of worship; that of the Catholics is a handsome building of Grecian architecture. There are several charitable institutions. Plumtree hospital for poor and aged widows is a neat brick building, coated with cement, rebuilt within a few years: beside the inmates, there are several out-pensioners. Collins's hospital is for twenty-four aged widowers or widows, who have each a tenement of two or three rooms and a weekly allowance, beside coals: the hospital is a neat brick building. Lambley hospital for decayed burgesses or their widows is a neat building consisting of a centre and two wings, with a green in front. There are a number of other hospitals or almshouses. The general hospital on Standard Hill (built A.D. 1781), and the county lunatic asylum (in which other patients as well as paupers are received), are spacious and commodious buildings. Thurland Hall, an antient house of the Elizabethan period, is still occasionally used for public dinners; it was the temporary residence of James I.

The principal manufactures carried on at Nottingham are bobbin-net and lace, and cotton and silk hosiery: nearly 7000 adult males were employed in these branches of industry in and about the town in 1831. There are several mills for spinning cotton and woollen yarn, and for throwing silk, and much cotton yarn is obtained from the mills of Derbyshire. The machines for making bobbin-net and lace, which are very expensive, are let out at a weekly rent to the workmen by capitalists, who invest a considerable sum in this kind of property. Steam-power has however been introduced of late into this manufacture. There are several dye-houses; there are also white-lead works and an iron-foundry. Wire-drawing, pin-making, and the manufacture of brass fenders are carried on to some extent; malting and brewing are also carried on, and 'Nottingham ale' has a high reputation. There are several windmills on the common north of the town. There are coal-pits in Radford parish, which employ 100 adult males. The market-days are Wednesday and Saturday for corn, cattle, and general provisions; the Saturday market is one of the principal in the midland counties. There are several yearly fairs for cattle, cheese, and cloth: at one of these fairs, distinguished as 'goose fair,' a considerable number of geese are sold. The trade of the town is much promoted by its proximity to the Trent, which is navigable, and from the communication thus afforded with the various canals connected with that river. The Nottingham canal passes close to the town, and joins the Trent at Trent bridge, a mile distant.

The corporation under the Municipal Reform Act consists of fourteen aldermen and forty-two councillors. The borough in its present enlarged extent is divided into seven wards, St. Ann's, Byron, Sneinton, Exchange, Canal, Radford, and Sherwood wards. Being a county, it has two sheriffs: there are a recorder, town-clerk, and other officers. The county magistrates have concurrent jurisdiction in the borough with the mayor and aldermen. Before the enlargement of the boundary, there was a police force of 100 men appointed by the magistrates at quarter-sessions; and some watchmen were maintained by private subscription. Water is supplied by three companies in abundance and at a reasonable rate. The assizes and quarter-sessions for the county are held here; also quarter-sessions for the borough; and a Court of Record for the borough every fortnight, and a sheriff's court every month for the recovery of small debts. The borough returns two members to parliament; the sheriffs are the returning officers. Nottingham is a polling-place for the northern division of the county.

The livings of St. Nicholas and St. Peter are rectories, of the clear yearly value of 216*l.* (with a glebe-house) and 336*l.* respectively: that of St. Mary is a vicarage, of the clear yearly value of 699*l.*, with a glebe-house. The perpetual curacy of St. James, Standard Hill, is of the yearly value of 200*l.* Radford and Lenton are vicarages, of the clear yearly value of 293*l.* and 139*l.* respectively; and Sneinton, a perpetual curacy of 227*l.* (*Clerical Guide*, 1836.)

There were, in 1833, in the three parishes of Nottingham and those of Lenton, Radford, and Sneinton, five infant-schools, with 540 scholars; eight boarding-schools, with 254 children; ninety-five day-schools (in a few of which boarders also were taken), with 4477 children; and forty-four Sunday-schools, with about 7840 children. Among the day-schools in this return were included the free grammar-school, with a valuable endowment, and 52 scholars; the Blue-Coat School, with 60 boys and 20 girls; a national school, with 573 children; three Lancasterian schools, with 484 children; and four other schools, wholly or chiefly supported by charitable contributions.

There is a public library and news-room in the market-place: the library consists of about 8000 volumes, besides a valuable collection of old books, kept separate from the rest (Lewis, *Top. Dict.*, 1831), and a mineralogical cabinet: in the buildings of this institution are lecture, news, and billiard rooms, and a law library: a literary society meets in the lecture-room. There is a mechanics' institute, established in 1824, which has a considerable library.

Ollerton is in the parish of Edwinstow, in the Hatfield division of Bassetlaw hundred, 137 miles from London by Newark, and 18½ miles from Nottingham. The whole parish of Edwinstow has an area of 17,270 acres, with a population, in 1831, of 1992, nearly half agricultural: the chapelry of Ollerton had 658 inhabitants, more than a third agricultural. The town is on the banks of the Maun; it has a neat Gothic chapel of modern erection, a Methodist chapel, and some good inns. A considerable quantity of hops is grown round the town. The market, which is on Friday, is small: there are a hop-market every Tuesday in September, and a yearly cattle and sheep fair. The living of Edwinstow, united with the three chapelries of Ollerton, Palethorpe, and Carburton (all in the parish), is a vicarage, of the clear yearly value of 639*l.*, with a glebe-house. The village of Edwinstow, which is on the Maun, above Ollerton, is extremely rural. The church is a venerable Gothic building, with a lofty spire. There were in the chapelry, in 1833, three day-schools, with 95 children, and two Sunday-schools, with 142 children.

Southwell is in that part of the liberty of Southwell and Scrooby which lies between the north and south divisions of Thurgarton hundred, 132½ miles from London by Newark, or 137 by Nottingham, from which it is distant 13 miles. It is likely that there was a Roman station here, or perhaps a fortified outpost of the neighbouring station of Ad Pontem, which antiquaries generally fix on the Trent, not far off. The name 'Burgage,' given to one of the districts of the town, is probably derived from the late Latin term 'burgus' (πύργος), a tower, and the remains of a fosse on 'the Burgage Hill' probably indicate the site of the Roman fort. Several Roman bricks have been used in the antient ecclesiastical buildings. A church was established here by Paulinus, one of the early missionaries sent over to convert the Anglo-Saxons, which became collegiate, and was richly endowed by the liberality of prelates and nobles of a subsequent age. Charles I. was frequently at Southwell during the civil war, and here he surrendered himself to the Scotch commissioners. The town is on a pleasant eminence near the small river Greet, an excellent trout-stream. It is a tolerably large place, with well-paved streets and well-built houses, and comprises the burgage, or burridge, the high town or prebendage (which two divisions constitute Southwell proper), and the adjacent hamlets of East Thorpe, West Thorpe, and Normanton. The whole parish has an area of 4550 acres, with a population of 3384, less than a third agricultural.

The collegiate church at Southwell is a large and magnificent cruciform building, consisting of nave and aisles, choir, transepts, and eastern transepts, two western towers, and a central tower. The nave and transepts and the towers are Norman, of very bold character and well-executed details. The towers are richly ornamented; the central tower, which is very massive, is also Norman. The extreme length of the church is 306 feet, breadth of the nave and aisles 59 feet, breadth at the transepts 121 feet. The choir and eastern transepts are of early English character, and the chapter-house decorated English, of an early period. There are some windows, of later insertion, of perpendicular character, particularly a large western window. The arches which support the centre tower, and several of the Norman doors, are fine; and the north porch is a large and much-enriched specimen of Norman. The piers of the nave are round and short; the windows of the triforium are large, and the clerestory windows small, showing circles on the outside and arches with shafts within. The nave and transepts have a wooden flat ceiling; the aisles have a stone groined roof. The early English portions are among the finest specimens of that style in the kingdom, and are in good preservation. The chapter-house is a fine specimen of early decorated: it has no centre pillar. The organ-screen and some stalls in the church are of later decorated character, and are peculiarly beautiful. Within the last fifty years two spires which crowned the western towers have been removed, and pinnacles of an incongruous character substituted. This noble building is well situated, being surrounded by a fine open space sufficient to give every side full effect. (Rickman's *Gothic Architecture;* plates in Rastall's *Southwell*, and in Cayley and Ellis's edition of Dugdale's *Monasticon.*)

The chapter of Southwell collegiate church consists of sixteen prebendaries, who keep residence each in rotation for three months. There is a vicar-general and commissary; and there are six vicars choral, five of whom have residences assigned to them, and a sixth has a house as vicar of Southwell. The gross yearly income of the church is 2211*l.*, the net income 954*l.* The prebendaries have also separate revenues. The vicarage of Southwell is of the clear yearly value of 144*l.*, with a glebe-house.

The entrance into the 'minster-yard' is by antient gateways, of which the western has a semicircular arch. In the yard are the extensive ruins of a former palace of the archbishops of York, the patrons of the church, consisting chiefly of the chapel and great hall, which have been fitted up as a modern residence: they are covered with ivy. Annual meetings of the Nottinghamshire clergy are held at Southwell, which is the mother-church of the county.

There are meeting-houses at Southwell for Methodists and Baptists, assembly-rooms and theatre, and a house of correction for the county.

The civil government of Southwell, the soke or liberty of Cum Scrooby, comprehending twenty townships, is separated from the rest of the county. The justices of the peace are appointed by the archbishop of York, but act under a commission from the crown: they hold quarter-sessions at Southwell and Scrooby. The chapter of Southwell, by their vicar, exercise all episcopal functions, except confirmation and ordination, over the peculiar of Southwell, which comprehends twenty-eight parishes. The soke and the peculiar are not coextensive.

There is little trade at Southwell, but the lace and hosiery manufacture employs from 100 to 200 workmen. (*Pop. Returns.*) There are several resident gentry. The market is on Saturday, and there are two yearly fairs.

There were in the parish of Southwell, in 1833, three boarding-schools and nineteen day-schools, with 419 scholars; and three Sunday-schools, with 408 children. Of the day-schools, four were supported by endowment; and in two others a few scholars were paid for from the proceeds of a charity. One of the boarding-schools, 'the Collegiate Grammar-school,' was partially supported by endowment.

Tuxford is in the South Clay division of the wapentake of Bassetlaw, 137¾ miles from London by Newark, and about 30 from Nottingham. The parish has an area of 3000 acres; the population, in 1831, was 1113, about one-third agricultural. The town has a modern appearance, having been rebuilt after a great fire, A.D. 1702. The principal trade is derived from its situation on the great north road, or from the cultivation of hops, which are grown to a considerable extent in the neighbourhood. The church exhibits a mixture of various styles of architecture. There is a Methodist meeting-house. The market is on Monday, and there are two yearly fairs, one for cattle and other live-stock, the other for hops. The living is a vicarage, of the clear yearly value of 260*l.*, with a glebe-house. There were, in 1833, an infant-school, with 84 children: an endowed free-school, with 40 boys; and four other day-schools, with 70 children; a national day and Sunday school, with 53 children in the week and 100 on Sundays; and two Sunday-schools, with 105 children.

Worksop is in the Hatfield division of the wapentake of Bassetlaw, 146 miles from London by Newark, and 26 from Nottingham. The area of the parish is 18,220 acres; the population, in 1831, was 5566, nearly half agricultural. The town is delightfully situated in a valley near the northern extremity of Sherwood Forest, and the neighbourhood is adorned by the magnificent seats of several noblemen. The town is near the river Rayton; it consists of one long principal street, with another branching from it at right angles. The streets are in general well paved, and the houses are well built. There is a 'moot-hall,' an antient building, for the public business of the town. The church is part of that which formerly belonged to a priory of canons of St. Augustin, founded here in the time of Henry I. by William de Luvetot. Its yearly revenues, at the dissolution, were 302*l.* 6*s.* 10*d.* gross, or 239*l.* 15*s.* 5*d.* clear. The church is a large building, originally cruciform, and of Norman architecture; but in the exterior are considerable admix-

tures of later styles. The western door is a beautiful Norman composition: at the east end of the present church is the tower, formerly central while the whole of the church was standing. The principal gateway of the priory is yet standing; the room over it is used as a national school, and there are several other remains of the priory, some of which have been incorporated with or converted into small dwelling-houses. There are Independent, Wesleyan and Primitive Methodist, and Catholic chapels, the latter near the manor-house, which is a seat of the duke of Norfolk. The manufactures of the town are trifling, but a good deal of business is done in malting. The market is on Wednesday, and there are three cattle-fairs, beside a statute fair. The Chesterfield Canal passes near the town: it is carried over the Rayton by an aqueduct. The living is a vicarage, of the clear yearly value of 388*l.*, with a glebe-house. There were in the parish, in 1833, eight boarding or day schools, with 244 children; two national schools, one of them partly supported by endowment, with 250 children; and three Sunday-schools, with 369 children.

Besides the above market-towns, there are several villages whose manufacturing industry has raised them to considerable importance. Basford is in the northern division of Broxtow wapentake, 2 or 3 miles north-west of Nottingham, near the right or west bank of the Lene. The area of the parish is 2720 acres; the population, in 1831, was 6325, about one-tenth agricultural. The village lies in a bottom, amid scenery of the richest character. The church has a handsome spire. The chief manufactures are those of hosiery, lace, and lace machinery, in which about 750 adult males are employed. There are cotton-mills, dye-houses, and bleaching-grounds, and several corn-mills. The court of the Honour of Peverel sits here; it has jurisdiction over Nottinghamshire and Derbyshire, and some places in Leicestershire: it is held twice a year for the decision of causes under 50*l.* The high-steward or his deputy presides. There is a gaol here connected with this court. The living is a vicarage of the clear yearly value of 260*l.* There were, in 1833, an infant-school, with 101 scholars; twelve day-schools, with 295 children; and ten Sunday-schools, with 1237 children. There are meeting-houses for Wesleyan Methodists, General Baptists, and Scotch Baptists.

Sutton in Ashfield is in the northern division of Broxtow wapentake, 3¼ miles south-west of Mansfield. The area of the parish (including the hamlet of Hucknall under Huthwaite and the extra-parochial district of Fulwood) is 6040 acres; the population, in 1831, was 5746, about one-sixth agricultural. The village is situated on an eminence, and consists of several streets. The church is north-west of the village; it is of middling size, dedicated to St. Mary. There are places of worship for General or Arminian and Particular or Calvinistic Baptists, Independents, and Methodists. Nearly 900 adult males are employed in manufactures, chiefly of hosiery, lace, and lace machinery. There is a pottery for garden-pots and other coarse red ware. The Mansfield and Pinxton Railway passes through the parish. A customary market for provisions is held weekly in this village. The living is a perpetual curacy, of the clear yearly value of 118*l.* There were, in 1833, an infant-school, with 120 children; a national school, with 125 boys; eleven other day-schools, with about 240 children; and six Sunday-schools, with 1002 children.

Greasley is in the south division of Broxtow wapentake, 7 miles north-west of Nottingham, on the road to Alfreton in Derbyshire. The parish has an area of 8010 acres; the population, in 1831, was 4583, about one-fifth agricultural. The church of Greasley is handsome and spacious, with a lofty embattled tower. Above 300 persons are employed in manufactures, chiefly in those of hosiery, lace, and lace machinery. The Nottingham Canal passes through the parish; there are several coal-wharfs on its line. The Mansfield and Pinxton Railway passes not far from this place. The living of Greasley is a vicarage, of the clear yearly value of 134*l.*, with a glebe-house. There were, in 1833, three schools, partially supported by endowments, with 96 children; one school of 30 girls, supported by private benevolence; fourteen other day-schools, with 393 children; one boarding-school, with 14 children; and ten Sunday-schools, with 885 children.

Arnold is in the northern division of Broxtow hundred, 3¼ miles from Nottingham, on the road to Mansfield. The area of the parish is 4670 acres; the population, in 1831, was 4054, about one-fifth agricultural. The village is large, extending nearly a mile in length. The houses are neat and comfortable. Between 400 and 500 adult males are engaged in manufacture, chiefly of hosiery and cotton goods. On Hollyhill, in the neighbourhood of Arnold, are the remains of a Roman camp. The living is a vicarage, of the clear yearly value of 310*l.*, with a glebe-house. There were, in 1833, an endowed school, with 48 boys; seven other day-schools, with 204 children; and seven Sunday-schools, with 808 children.

Bulwell is in the northern division of Broxtow wapentake: Attenborough, Stapleford, and Beeston are in the southern; Gedling is in the southern division of Thurgarton wapentake; Ruddington is in the northern division of Rushcliffe wapentake; and Radcliffe or Ratcliffe upon Trent is in the southern division of Bingham wapentake. These villages all lie within a circle of 5 or 6 miles round Nottingham, and have a population of from 1094 (Attenborough) to 2611 (Bulwell), chiefly engaged in the hosiery and lace manufacture, which employs about 300 adult males in Bulwell and Beeston, nearly as many in Gedling, and a smaller number in the other villages. Ratcliffe alone has few manufacturers in it: it gets its name from a bank or cliff of red clay in the neighbourhood. It has a wharf on the Trent for landing goods. Ruddington is in the honour of Tutbury, and within the jurisdiction of a court held at Tutbury every three weeks for the recovery of debts under forty shillings. It has an endowed free-school and an infant school. At Stapleford are a Druidical monument and a rude obelisk apparently of Saxon construction. Attenborough has some coal-pits. The Trent and the Erewash and the Nottingham Canal pass through or skirt the parish.

Warsop (population 1281), in the Hatfield division of Bassetlaw wapentake, and Kirkby-in-Ashfield (population 2032) and Mansfield Woodhouse (population 1859), in the north division of Broxtow wapentake, lie within a circle of 5 or 6 miles round Mansfield. The last two are manufacturing villages, and have upwards of 150 adult males engaged chiefly in the lace and hosiery manufacture. Kirkby in Ashfield has coal-pits and lime-pits, which employ 130 adult males, and for the produce of which the Mansfield and Pinxton Railway opens a channel. There is a parish school-house, built in 1836. Mansfield Woodhouse has a large antient church, built of stone, with a lofty tower and spire. The village contains some good houses. There are lime-kilns and freestone quarries, which employ 25 adult males. Roman antiquities of considerable interest have been found here.

Selston (population 1580), in the north division of Broxtow wapentake, and Eastwood (population 1395), in the south division, are on the western border of the county. About 100 persons are engaged in the manufacture chiefly of hosiery and lace in each parish; and there are extensive coal-works, especially in Eastwood parish. The Mansfield and Pinxton Railway passes near Selston, and the Nottingham Canal near Eastwood.

At Calverton (population 1196), in the southern division of Thurgarton wapentake, between Nottingham and Southwell, nearly 300 men are engaged in the hosiery and lace manufacture; at Sutton Bonnington, in the southern division of Rushcliffe wapentake, nearly 100; and at Hucknall-Torkard (population 2200), in the northern division of Broxtow wapentake, between Nottingham and Mansfield, upwards of 300.

Divisions for Ecclesiastical and Legal Purposes.—This county is included in the diocese and ecclesiastical province of York. It forms an archdeaconry comprising the several rural deaneries of Bingham, Newark, Nottingham, and Retford: beside the peculiar of Southwell, noticed above. The commissioners on the Established Church propose to subtract the archdeaconry of Nottingham from the diocese of York, in order to add it to that of Lincoln. The number of churches and chapels in the county is given in Browne Willis's *Cathedrals* (A.D. 1742), as 210, viz. 176 under the jurisdiction of the archdeacon of Nottingham, and 34 exempt; of which 28 are in the peculiar of Southwell, and 6 under the chapter of York. In the *Beauties of England and Wales* (A.D. 1813), the number of those under the archdeacon's visitation is given as 182, and the number of those exempt at 36; making a total of 218. In Lewis's *Topographical Dictionary* (1831) the number of parishes is given as 205, viz. 76 rectories, 89 vicarages, and the remainder perpetual curacies. In the *Geography of Great Britain and Ireland*, in the *Library of Useful Knowledge*, the number of parishes is given at 246.

The county is in the midland circuit: the assizes are held at Nottingham, to which place the judges proceed from Lincoln. The quarter-sessions are held each quarter at Nottingham, Newark, and East Retford. The jurisdiction of the soke of Southwell and Scroby has been mentioned in our topographical notice of Southwell. Some parishes are in the honour of Tutbury and subject to the court held there for the recovery of small debts. The court of the honour of Peverel, which has jurisdiction in suits under 50*l.* over Nottinghamshire and Derbyshire, and some parts adjacent, has been mentioned in our topographical notice of Basford, where the court sits.

The county gaol is at Nottingham: some new buildings have been added to it within the last few years. The county house of correction is at Southwell. The number of committals to these two places of confinement in the years from October, 1834, to October, 1835, and from October, 1835, to October, 1836, were as follows:—1834-5, Nottingham, 60 felons, 24 debtors; Southwell, 808 felons and misdemeanants: 1835-6, Nottingham, 333 felons and misdemeanants, 64 debtors; Southwell, 550 felons and misdemeanants. The great increase in the number of felons committed to Nottingham in 1835-6, and the decrease of the number committed to Southwell, were owing to the arrangements made by the magistrates of the county.

The number of members returned to parliament from Nottinghamshire before the Reform Act was eight, viz. two knights of the shire, who were elected at Nottingham, two members each for the boroughs of Nottingham and Newark, and two members returned by the burgesses of East Retford, conjointly with the freeholders of the wapentake of Bassetlaw. The admission of the freeholders took place a short time before the Reform Act by an act of parliament passed in consequence of the corruption of the burgesses. By the Reform Act the county was divided, and each division returns two members. The northern division comprehends the wapentakes of Bassetlaw and Broxtow. The court of election is held at Mansfield; and the polling-stations are Nottingham, Mansfield, and East Retford. The southern division comprehends the wapentakes of Rushcliffe, Bingham, Newark, and Thurgarton; the court of election is held at Newark, and the polling-stations are Newark upon Trent, Bingham, and Southwell. The number and distribution of borough members remained unaltered by that act.

History; Antiquities, &c.—In the earliest period of British history the county seems to have been included in the territory of the Coritani. Of these, its original inhabitants, it retains however very few memorials. There are some vestiges of a camp or fortification on a hill at Barton near the Trent, 4 or 5 miles south-west of Nottingham; and a few tumuli or barrows in different parts of the county, which are supposed to have had a British origin. To these we may add the caves in the sandstone rock at and near Nottingham, already noticed.

In the division of the island by the Romans, the county was included in the province of Flavia Cæsariensis. The Roman stations Ad Pontem, Margidunum, and Verometum, were probably in the county, and Segelocum was probably only just out of it on the Lincolnshire side of the Trent, near Littleborough. Ad Pontem was probably on the Trent near Southwell. Horsley was disposed to fix it at Farndon, a short distance above Newark, and it is probable that he is about right. Margidunum was probably near East Bridgeford, on the south bank of the Trent between Nottingham and Newark. There are the undoubted remains of a Roman camp there, and several Roman antiquities have been dug up. The foundations of Roman buildings were observed there by Stukeley. Verometum is close to the south border of the county near the village of Willoughby. There are some remains of the rampart and ditch which surrounded the station; and some foundations, mosaic pavements, coins, and other antiquities have been dug up. Of the Roman roads which connected these stations there are several traces. The Foss Way may be traced from Verometum for several miles in the direction of Newark: in several parts it is a deep ditch.

Many Roman remains have been discovered near Newark, which has probably risen from the ruins of some of the neighbouring Roman posts; and coins have been found in various other parts. But the most remarkable discovery was of the foundations of a Roman villa at Mansfield Woodhouse, in A.D. 1786. The pavement and other antiquities found are minutely described by Major Rooke, the discoverer, in the 8th volume of the 'Archæologia.'

In the Saxon period it is likely that Nottingham was possessed at first by the Northumbrian Angles. When Redwald attacked Ethelfrith of Bernicia, who had expelled Edwin from the throne of Deira, or Yorkshire, the decisive battle took place in Nottinghamshire on the banks of the Idle (A.D. 617). When the Mercians became independent of Northumbria (A.D. 626), this county appears to have been included in their dominion: it was divided between the northern and southern Mercians, who were separated from each other by the Trent.

When the Northmen, under the sons of Regnar Lodbrog, invaded England, they passed the winter (A.D. 867-868) at Nottingham, which they had taken. They were attacked in the ensuing spring by the combined force of Wessex, under the king, Ethelred I., and his brother Alfred, and Mercia under Burrhed, king of that country. Neither party being able to obtain a decisive advantage, they made a treaty by which the Northmen retired to York. A few years after they re entered Mercia, which they conquered; and by their treaty with Alfred (A.D. 878 or 880) obtained possession of that part which was north-east of Watling Street, including Nottinghamshire. The Mercian territory thus acquired appears to have been divided between the Danish burghs, of which Nottingham was one. These burghs were compelled by Edmund I. (A.D. 942) to submit to Wessex, but they seem to have retained the constitution of their local government, probably till near the time of the Conquest. After the Conquest, the greater part of the county, together with the castle of Nottingham, was bestowed by William the Conqueror on his natural son, William Peverel. He, or one of his successors, supported Stephen in his usurpation. With his Nottinghamshire men he assisted in defeating the Scots in the battle of the Standard near Northallerton (A.D. 1138), and was taken prisoner with Stephen at the battle of Lincoln (A.D. 1141). His castle of Nottingham was taken, and the town burnt, by the partisans of the empress Maud. In the civil war carried on by the sons of Henry II. against their father, Nottingham was taken by surprise by Robert, earl of Ferrers, a partisan of the young princes. In the civil war of John's reign, the only event connected with the county was the death of that prince at Newark, October, 1216. In the early part of the reign of Edward III., Roger Mortimer was seized by the king in Nottingham Castle.

In the rebellion of Lambert Simnel (A.D. 1487) the forces of that pretender, consisting of 2000 German veterans under Martin Swart, an experienced officer, and about 6000 half armed Irishmen, were encountered by the royal army under Henry VII. in person, at East Stoke, on the right bank of the Trent, near Newark. The rebels were defeated; half of them were slain, including their leaders, the earl of Lincoln and Swart. Simnel was taken prisoner; and Lord Lovel, another leader, escaped from the fray, but was either drowned in his flight across the Trent, or was compelled to conceal himself for the rest of his days. (Carte, *Hist. England.*)

At the commencement of the civil war of Charles I. the king set up his standard at Nottingham with great ceremony (A.D. 1642). Shortly after this Nottingham came into the hands of the parliament, and continued so to the end of the war. Newark, which was held by a body of Royalists under the command of Sir John Henderson, was besieged (A.D. 1644) by a body of parliamentary forces under Sir John Meldrum and Lord Willoughby of Parham. Prince Rupert, advancing to relieve the place, surprised the besiegers by the rapidity of his march, drove part of their forces over the Trent, and compelled another portion to capitulate, with all their artillery and ammunition. In the winter of 1644-45 it was again besieged by the Parliamentarians, but without success, the garrison having been relieved by Sir Marmaduke Langdale, who was sent by Prince Rupert for that purpose. The troops at Newark, now under Sir Richard Byron, being thus relieved from siege, were of material service to the king's cause in this part, beating some parliamentary detachments and keeping their posts in a state of alarm. Among other services, a detachment from this garrison assisted at the storming of Leicester in 1645. Not long after his defeat at Naseby the king was at Welbeck, in the northern part of the county, and marched northward to Doncaster, with the view of joining Montrose in Scotland. Upon the arrival of a body

of Scots horse however at Rotherham, the king retired to Newark, whither Sir Marmaduke Langdale had retreated after the battle of Naseby (A.D. 1645). From Newark the king marched to Oxford, but was again at Newark in October of the same year; and it was there that he was deserted by his nephews Rupert and Maurice, and by several of his officers. In November, being pressed by the approach of the Scots under the earl of Leven, and by a body of Parliamentarians under Poyntz from the west, he withdrew to Oxford. Newark was forthwith besieged by the Scots; and in May, 1646, the king surrendered himself at Southwell to the Scotch commissioners, by whom he was conducted to the besiegers' quarters. The day after his arrival Newark was delivered up by his orders. In 1648 Cromwell was in Nottinghamshire with the troops destined to oppose the English Royalists under Sir Marmaduke Langdale and the Scots under the duke of Hamilton. Monk with his army marched through Nottinghamshire, passing through Mansfield, Southwell, and Nottingham in his way southward (A.D. 1660) to restore the king.

Of architectural antiquities Nottinghamshire is somewhat barren, and its ecclesiastical buildings are, with two or three exceptions, such as St. Mary's Church at Nottingham and Southwell Collegiate Church, already described, by no means remarkable for splendour. Balderton, Hovringham, and Mansfield churches have some Norman portions; Newark church has some slight remains of Norman: the churches of Bingham, Coddington, Hawton near Newark, and Upton St. Peter near Southwell, have considerable portions of early English: Hawton is especially worthy of examination. Of the monastic ruins the most beautiful is Newstead. Here was a priory of Black or Austin Canons, founded by Henry II. about A.D. 1170, whose yearly revenues at the dissolution were estimated at 219*l*. 18*s*. 8½*d*. gross, or 167*l*. 16*s*. 11¼*d*. clear. The rest of the monastic buildings were fitted up as a residence by Sir John Byron, to whom they were granted, but the chapel was allowed to go to decay. Its front is an exceedingly beautiful specimen of early English, scarcely equalled by any other specimen in elegance of composition and delicacy of execution. Of Rufford Abbey, near Ollerton, there are some remains incorporated in a large mansion of later date, which retains the original designation. It was a Cistertian abbey, founded by Gilbert, earl of Lincoln, A.D. 1148: its yearly revenues at the dissolution were 254*l*. 6*s*. 8*d*. gross, or 176*l*. 11*s*. 6*d*. clear. Of Welbeck Abbey the only remains are some of the arches of the vaults and some walls of the superstructure, now incorporated in the mansion of the duke of Portland. The revenues of this abbey for Premonstratensian canons (founded A.D. 1153) were at the dissolution 298*l*. 4*s*. 8*d*. gross, or 249*l*. 6*s*. 3*d*. clear. Part of the cloisters and some other portions of Mattersey Gilbertine Priory, near the Idle, yet remain. There are also some remains of Thurgarton Priory for Austin canons. There is an antient castle at Newark; also a handsome cross.

(Thoroton's *Nottinghamshire*, by Throsby; *Beauties of England and Wales;* Conybeare and Phillips, *Outlines of the Geology of England and Wales;* Rickman's *Gothic Architecture;* Rastall, *History of Southwell;* Palgrave's *Rise and Progress of the English Commonwealth;* Turner's *Anglo-Saxons;* Lewis's *Top. Dictionary; Parliamentary Papers.*)

STATISTICS.

Population.—Nottinghamshire is chiefly a manufacturing county, a large proportion of its population is also engaged in agriculture. In 1831 it ranked the 30th on the list of agricultural counties. Of 66,582 males twenty years of age and upwards, 14,260 were engaged (in 1831) in manufactures or in making manufacturing machinery, and 16,856 were occupied in agriculture; of this latter number 11,799 were labourers. Most of those employed in manufactures were engaged in the manufacture of stockings and lace; of these there were at Nottingham, 4740; at Radford, 1300; at Mansfield, 800; at Sutton-in-Ashfield, nearly 800; at Basford, 750; at Snenton, 430; at Hucknall-Torkard, at Beeston, at Linton, and at Carlton, upwards of 300 each; at Bulwell, Greasley, and Calverton, about 280 each; at Kirby-in-Ashfield, Mansfield-Woodhouse, Stapleford, Southwell, Lambley, Ruddington, and Selston, between 200 and 100 each. In most of the places here named the manufacture of stockings, lace, frame-work machinery, and the materials of the lace manufacture, are conjoined or intermingled so as not to be distinguishable in a general description. There were 50 weavers at Newark and 19 at Hawton; sacking is made at West Retford; candle-wicks at Gamston.

The population of Nottinghamshire, as given at each time the census was taken, was as under:—

	Males.	Females.	Total.	Increase per cent.
1801	68,558	71,792	140,350	..
1811	79,057	83,843	162,900	16·06
1821	91,491	95,382	186,873	14·70
1831	110,457	114,870	225,327	20·57

showing an increase, between the first and last periods, of 84,977, or not quite 38 per cent. on the whole population: being 19 per cent. below the whole increase in England and Wales.

The following table contains a summary of the population of every hundred, as taken in 1831:—

HUNDREDS or WAPENTAKES, BOROUGHS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males twenty years of age.
Bassetlaw —											
Hatfield Division .	3,845	4,001	21	96	2,220	1,058	723	9,723	9,738	19,461	5,032
North-Clay Division	2,189	2,254	6	105	968	708	578	4,995	5,300	10,295	2,529
South Clay Division	1,505	1,595	5	32	1,119	306	170	3,798	3,698	7,496	2,002
Bingham, North and South Divisions .	2,394	2,573	13	65	1,615	589	369	6,246	6,196	12,442	3,114
Broxtow, North and South Divisions .	12,662	13,068	191	495	1,990	8,463	2,915	32,534	32,765	65,299	16,125
Newark, North and South Divisions .	1,496	1,572	3	37	996	340	236	3,745	3,809	7,554	1,919
Rushcliffe, North and South Divisions .	2,118	2,236	5	53	1,211	713	312	5,519	5,401	10,920	2,731
Southwell and Scrooby (Liberty) . .	2,216	2,271	19	59	1,247	679	345	5,477	5,574	11,051	2,794
Thurgarton, North and South Divisions (Hundred or Wapentake)	4,082	4,259	48	272	1.813	2,034	412	10,305	10,267	20,572	5,352
Newark-upon-Trent (Borough) . .	2,022	2,087	9	62	63	1,019	1,005	4,499	5,058	9,557	2,337
Nottingham (Town and County of the Town) . . .	10,407	10,901	136	435	109	9,669	1,123	23,616	27,064	53,680	12,647
Totals . .	44,936	47,117	466	1,701	13,351	25,578	8,188	110,457	114,870	225,327	56,582

County Expenses, Crimes, &c.—The sums expended for the relief of the poor at the four dates of

		£		s.	d.	
1801	were	44,222,	being	6	3	for each inhabitant.
1811	..	88,013	„	10	9	„
1821	..	73,315	„	7	10	„
1831	..	72,717	„	6	5	„

The sum expended for the same purpose for the year ending March, 1838, was 55,003*l.*: and if it be assumed that the population had the same rate of increase between the years 1831 and 1838 as it had during the ten years preceding 1831, the above sum gives an average of 4*s.* 3*d.* for each inhabitant. These averages are below those for the whole of England and Wales.

The sum raised in Nottinghamshire for poor-rate, county-rate, and other local purposes, in the year ending 25th of March, 1833, was 116,380*l.*, and was levied upon the various descriptions of property as follows:—

On land	£75,634	14*s.*
Dwelling-houses	34,494	0
Mills, factories, &c.	4,782	13
Manorial profits, navigations, &c.	1,469	8
Total	116,380	15

The amount expended was—

For the relief of the poor	£74,762	10
In suits of law, removal of paupers, &c.	3,705	11
For other purposes	39,446	1
Total money expended	117,914	2

In the returns made up in subsequent years the descriptions of property assessed are not specified. In the years 1834, 1835, and 1836, there were raised 101,235*l.* 12*s.*, 92,912*l.* 6*s.*, 84,791*l.* 10*s.*, and the expenditure of each year from 1834 to 1838 was as follows:—

	1834. £.	1835. £.	1836. £.	1837. £.	1838. £
For the relief of the poor	66,030	55,182	50,366	46,762	55,003
In suits of law, removal of paupers, &c.	3,979	3,387	2,825	1,956	1,296
Payments towards the county-rate	30,522	21,191	20,276	not given.	19,545
For all other purposes		13,824	13,045	8,993	6,726
Total money expended	£100,531	93,584	86,512		82,570

The saving effected in the whole sum expended in 1838, as compared with that expended in 1834, was therefore 17,961*l.*, or more than 17 per cent.; and the sum expended for the relief of the poor in 1838 was less than that in 1834 by 10,027*l.*, or not quite 17 per cent.

The number of turnpike trusts in Nottinghamshire, as ascertained in 1836, under the acts 3 and 4 William IV., c. 80, were 22; the number of miles of road under their charge was 302. The annual income arising from tolls and parish composition in lieu of statute duty, in 1836, was 17,886*l.*, and the annual expenditure in the same year was as follows:—

Manual labour	£4,894	10
Team labour, and carriage of materials	653	13
Materials for surface repairs	2,203	3
Land purchased	87	12
Damages done in obtaining materials	105	18
Tradesmen's bills	586	5
Salaries of treasurer, clerk, and surveyor	1,394	6
Law charges	172	1
Interest of debt	4,877	4
Improvements	1,147	17
Debts paid off	420	0
Incidental expenses	294	8
Estimated value of statute duty performed	1,236	4
Total expenditure	18,073	4

The county expenditure in 1834, exclusive of that for the relief of the poor, was 15,532*l.* 11*s.*, disbursed as follows:—

Bridges, building, repairs, &c.	£273	3
Gaols, houses of correction, &c., and maintaining prisoners	3,437	12
Shire halls, and courts of justice, building, repairing, &c.	£2,418	13
Lunatic asylums	627	16
Prosecutions	1,694	14
Clerk of the peace	1,268	18
Conveyance of prisoners before trial	653	16
Conveyance of convicts	217	17
Vagrants, apprehending and conveying	264	19
Constables, high and special	151	10
Coroner	264	5
Debt, payment of, principal and interest	1,685	0
Miscellaneous	2,274	9
Total expenditure	15,232	11

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 1227, 1657, and 2255 respectively, making an average of 175 annually in the first period, of 237 in the second period, and of 322 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 103, 108, and 98 respectively. Among the persons charged with offences there were committed for—

	1831.	1832.	1833.
Felonies	95	104	93
Misdemeanors	8	4	5

The total number of committals in each of the same years was 123, 97, and 98 respectively.

	1831.	1832.	1833.
The number convicted was	101	93	87
Acquitted	18	8	22
Discharged by proclamation	7	5	4

There were 250 persons charged with crimes at the assizes and sessions in Nottinghamshire in 1838. Of these 9 were charged with offences against the person, only 1 of which was a common assault; 21 were charged with offences against property committed with violence; 216 with offences against property committed without violence; none were charged with malicious offences; and 4 were charged with various misdemeanors.

Of the whole number committed, 202 were convicted, 33 were acquitted, 2 were not prosecuted, and no bill was found against 13. Of those convicted, 1 was sentenced to death, and had his punishment commuted to one year's imprisonment; 54 were transported for various periods: 18 were imprisoned for one year; and 127 for six months or under; 1 was fined. Of the whole number of offenders, 217 were males and 33 females; 80 could neither read nor write; 145 could read and write imperfectly; 20 could read and write well; one had received superior instruction; and the degree of instruction of the remaining 4 could not be ascertained.

The number of persons registered to vote for county members in 1837 was 7010. Of these, 4419 were freeholders, 67 leaseholders, 477 copyholders, 1978 occupying tenants, 67 trustees, and 2 mortgagees: being 1 in 32 of the whole population, and 1 in 8 of the male population twenty years of age and upwards, as taken in 1831.

Nottinghamshire contains six savings' banks: the number of depositors and amount of deposits on the 20th of November, in each of the following years, were as under:—

	1832.	1833.	1834.	1835.
Number of depositors	8,078	8,597	9,150	9,723
Amount of deposits	£223,650	£236,260	£250,585	£271,075

The various sums in the savings' banks in 1836, 1837, and 1838, were distributed as under:—

	1836.		1837.		1838.	
	Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	5,973	£30,903	6,487	£39,784	7,099	£48,954
„ 50	2,723	80,974	2,792	84,629	2,747	85,783
„ 100	1,224	81,929	1,224	83,633	1,249	86,332
„ 150	419	49,967	403	48,111	437	52,541
„ 200	227	37,366	243	40,448	249	41,606
Above 200	39	8,277	35	7,734	32	6,911
	10,605	293,336	11,183	304,339	11,813	322,367

Education.—The following summary is taken from the Parliamentary Returns on Education made in the session of 1835.

	Schools.	Scholars.	Total.
Infant schools . . .	34		
Number of children at such schools; ages from 2 to 7 years:—			
Males . .		578	
Females . .		639	
Sex not specified .		355	
			1,572
Daily schools . . .	647		
Number of children at such schools; ages from 4 to 14 years:—			
Males . .		9,670	
Females . .		7,532	
Sex not specified .		2,665	
			19,867
Schools . .	681		
Total of children under daily instruction . . .			21,439
Sunday-schools . . .	366		
Number of children at such schools; ages from 4 to 15 years:			
* Males . .		14,085	
Females . .		13,953	
Sex not specified .		4,132	
			32,170

Assuming that the population between the ages of 2 and 15 years has increased in the same proportion as the whole of the population since 1821, and that the whole population has increased in the same ratio since 1831 as in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 years thus found residing in Nottinghamshire in 1833 was about 78,113. Twenty-three Sunday-schools are returned from places where no other school exists, and the children, 1335 in number, who are instructed therein cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Seventeen schools, containing 938 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. Making allowance for this cause therefore, we may perhaps fairly estimate that less than two-thirds of the children between the ages of 2 and 15 years are under instruction in this county.

Maintenance of Schools.

Description Schools.	By endowment.		By subscription.		By payments from scholars.		Subscription and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	1	78	2	103	32	569	9	816
Daily Schools	86	2,225	35	2,166	502	13,637	24	1,839
Sunday Schools	4	171	352	31,505	2	41	8	453
Total....	91	2,471	389	33,780	536	14,247	41	3,108

The schools established by Dissenters, included in the above statement, are—

			Scholars.
Daily schools . .	21,	containing	1,134
Sunday-schools . .	168	.	17,659

The schools established since 1818 are—

Infant and other daily schools	301,	containing	10,184
Sunday-schools . .	247	.	22,745

Twenty-eight boarding-schools are included in the number of daily-schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists and Roman Catholics.

Lending-libraries of books are attached to 50 schools in this county.

NOUN (in Grammar), the name of one of the parts of speech into which grammarians have distributed the words of a language. The noun generally expresses the subject of discourse, or the name (*nomen*) of the thing spoken of, as *horse, table, darkness,* &c.; but it may also be used as the predicate, as in the sentence, 'Tin is a metal,' where both 'tin' and 'metal' are nouns.

So far as respects the form of nouns, that is, the sounds of which they are composed, they are capable of classification in all languages. The nature of this classification may be explained from examples in our own language. Many nouns are simple roots, as *horse, ship, man, tree;* while others are formed by adding a suffix to the root or to other words. [NOTION, NOTIONAL.]

The following list of nouns, formed by suffixes, belong to the Saxon part of our language. A few examples of each suffix are given in order to show the use of each suffix more clearly:—

Er.	Ster.	Ard.	Eer.
build-er	game-ster	drunk-ard	mountain-eer
box-er	malt-ster	slugg-ard	chariot-eer
walk-er	song-ster	dast-ard	musket-eer
scoff-er	pun-ster	blink-ard	engin-eer

Some of the words in *er, ster,* and other terminations, have a corresponding feminine termination in *ess, ix,* or *stress,* as *murderess, songstress, executrix.* The termination *ix* is of Latin origin.

Ling.	Kin.	Let.
fat-ling	lamb-kin	rivu-let
first-ling	pump-kin	cut-let
dar-ling (dear-ling)	pip-kin	stream-let
fond-ling	manni-kin	is-let

These three terminations generally, but not always, give to the root the notion of smallness, and hence they belong to the class called diminutives.

Dom.	Hood.	Ness.
king-dom	boy-hood	bad-ness
wis-dom	child-hood	base-ness
prince-dom	false-hood	cold-ness
thral-dom	man-hood	dark-ness

Rick—as bishop-ric; Wick—as bail-wick.

Ship.	Th (from adjectives, with a change in the vowel).	T (mostly past participles).
friend-ship	leng-th	gif-t
hard-ship	bread-th	draf-t
partner-ship	dep-th	join-t
court-ship	streng-th	thef-t

The following terminations are of Latin and Greek origin, though most of them seem to have come through the Norman portion of our language:—

Acy.*	Age.†	An or Ian.	Ance.	Ancy.‡
conspir-acy	append-age	pag-an	abund-ance	depend-ancy
fall-acy	band-age	artis-an	repent-ance	expect-ancy
suprem-acy	broker-age	guard-ian	resist-ance	occup-ancy
lun-acy	cord-age	tragedi-an	observ-ance	vac-ancy

Ary.	Ate.	Ence.	Ency.
api-ary	advoc-ate	consci-ence	ag-ency
lumin-ary	potent-ate	consequ-ence	clem-ency
emiss-ary	prim-ate	impot-ence	curr-ency
libr-ary	gradu-ate	infer-ence	tend-ency

Ent.	Ice.	Ics.	Ion.
correspond-ent	mal-ice	eth-ics	adopt-ion
presid-ent	just-ice	opt-ics	animat-ion
stud-ent	avar-ice	mechan-ics	anticipat-ion
ag-ent	coward-ice	phys-ics	corrupt-ion

Ism.	Ist.	Ment.	Ory.
athe-ism	bapt-ist	allure-ment	audit-ory
bapt-ism	de-ist	enjoy-ment	vict-ory
critic-ism	flor-ist	entice-ment	direct-ory
fanatic-ism	fatal-ist	frag-ment	deposit-ory

Or or Tor.	Tude.	Ty.	Ure.
correct-or	alti-tude	facili-ty	depart-ure
inspect-or	forti-tude	liber-ty	fig-ure
jur-or	grati-tude	plen-ty	literat-ure
edit-or	lati-tude	civili-ty	press-ure

The preceding list contains the majority of the terminations of nouns in the English language which are not simple roots. The number, case, and gender of nouns in general are explained in the articles NUMBER, DUAL NUMBER, GENDER, ABLATIVE and ACCUSATIVE CASES.

NOUREDDIN (Malek-al-Adel Noor-ed-deen Mahmood), one of the most celebrated and powerful of the Moslem rulers of Syria in the age of the Crusades, born A.D. 1117, A.H. 511, was a younger son of Amad-eddin

* Usually formed from adjectives in *ate*, as accur-ate, accur-acy.
† Apparently from the barbarous Latin *agium*.
‡ Usually formed from adjectives in *ant*, as abund-ant, abund-ancy.

Zenghi, the second of the dynasty of the Atabeks of Irak an Syria. At the death of his father, who was murdered by his own Mamlukes at the siege of Jabbar, A.D. 1146, A.H. 541,* Noor-ed-deen, hastening to Aleppo with the signet of the deceased prince, secured the possession of that city and of his father's Syrian dominions; while Mesopotamia, with Moossool for a capital, fell to the lot of the elder brother Seif-ed-deen; and the feeble attempts of Alp-Arslan, a prince of the house of Seljuk, to assert his ancestral claims to the dominion of these provinces, were easily frustrated by the combined power of the two brothers. The earliest exploits of the reign of Noor-ed-deen were in continuance of the *Holy* War which his father had assiduously waged against the Latin Christians of Palestine: Josceline de Courtenay, whose capital of Edessa had been taken by Zenghi a few years previous, was signally repulsed in an attempt to recover it, and the Christian inhabitants, who had aided the enterprise, were put to the sword without mercy by command of Noor-ed-deen, who even levelled the fortifications of the town to prevent its ever again becoming a bulwark to the kingdom of Jerusalem. The recovery of this important fortress was the avowed object of the second crusade, undertaken A.D. 1148, under Louis VII. of France and the emperor Conrad: but of the mighty hosts which they led from Europe, only a miserable and dispirited remnant escaped the arrows of the Seljuki Turks in their march through Anatolia to Palestine; the project of retaking Edessa was abandoned as hopeless; the siege of Damascus, which was attacked by the crusading monarchs in conjunction with Baldwin III. of Jerusalem [BALDWIN III.], was foiled when on the eve of success by the address with which the minister of the Moslem prince Modjir-ed-deen fomented the mutual jealousies of the Christian leaders; and this vast armament, which if properly directed might have overwhelmed the rising power of Noor-ed-deen, only served by its failure to extend and confirm it. Resuming the offensive immediately after the departure of the crusaders, he invaded the territory of Antioch, and in a pitched battle (June 27, 1149) routed and slew the prince Raymond, whose head was sent as a trophy to the caliph at Bagdad; and though he sustained a severe defeat in the following year from his antient opponent Josceline de Courtenay, who surprised his camp, this disgrace was amply compensated by the captivity of that active leader, who was soon after seized while hunting by a marauding party of Turkomans, and died in confinement, while the remaining dependencies of Edessa, the fortresses of Aintab, Tellbasher, Ravendan, &c., fell almost without resistance into the power of Noor-ed-deen, whose dominions now included the whole of Northern Syria. Modjir-ed-deen† was still the nominal ruler of Damascus and the southern portion, but the government was entirely in the hands of his vizier Moin-ed-deen Anar, whose daughter Noor-ed-deen had married; and after the death of this able minister, the inhabitants, alarmed at the capture of Ascalon by Baldwin III. in 1153, and dreading an attack from the Christians, voluntarily offered their allegiance to Noor-ed-deen (1154) as the price of his protection; the weak Modjir-ed-deen resigned his power, and sought an asylum at the court of the caliph of Bagdad, which then seems to have been the usual retreat of deposed princes; while Noor-ed-deen, the circuit of whose realms now encompassed on all sides by land the Latin territories in Palestine, and extended to the frontiers of the Fatimite possessions in Egypt, fixed his capital at Damascus, which he raised from the ruinous state in which it had been left by an earthquake, and adorned with mosques, fountains, colleges, and hospitals. Several years of continual but varied warfare against the Christians followed the union of all the Moslem power of Syria under a single head; the sway of Noor-ed-deen was from time to time enlarged by acquisitions, not only from the enemies of Islam, but from the sultan of Iconium and the minor Moslem princes of Mesopotamia; but a malady which attacked him in 1159, followed by a false report of his death, might have occasioned a fatal reverse in his fortunes, but for the prudence of Ayoob (the father of the famous Salah-ed-deen, or Saladin), who controlled the impatience of his brother Assed-ed-deen Shîrakoh to take advantage of the supposed decease of their patron. The Greek emperor Manuel Comnenus was preparing at this time to attack Aleppo in concert with the Franks of Antioch; but this new enemy was diverted by negotiation, and by the release of 6000 Greek captives; and the only advantage reaped by the Christians from this crisis was the capture of the fortress of Al-Harem near Antioch. The death of Baldwin III. in 1162 released Noor-ed-deen from the ablest of his antagonists, his brother and successor, Almaric, or Amaury, being far inferior to Baldwin both in prowess and abilities: the war however was prosecuted with unabated vigour and various success: on one occasion, at the siege of Hisn-al-Akrad (the castle of the Koords), the Moslem leaguer was surprised by the Templars, and their monarch himself escaped death or captivity only by the self-devotion of an attendant; but this discomfiture was speedily retrieved by a victory in which the famous Reginald de Chatillon, prince of Antioch, was taken prisoner, and which was followed by the recapture of Al-Harem. But the state of affairs in Egypt, where the Fatimite caliphate was now tottering to its fall [FATIMIDES], opened new views of aggrandisement and a wider field of ambition to both the Christian and Moslem rulers of Syria; the descendants of Ali had become puppets in the hands of their vizier, or Emir-al-Joyush (generalissimo), who wielded all the real authority of the state: two emirs, Dargam and Shawer, had contested in arms this high dignity; and the latter, defeated and expelled from Egypt, sought refuge and aid from Noor-ed-deen. The sovereign of Damascus eagerly embraced the opportunity of obtaining a footing in Egypt, and despatched a force under Shîrakoh and his nephew Salah-ed-deen to reinstate Shawer (1163); whose rival called in the Christians of Palestine to his support: but ere Amaury could enter Egypt, Dargam had been overpowered and slain by Shîrakoh, who replaced Shawer in his former power. But Shawer, faithless alike to friend and foe, now entered into arrangements with the Franks in order to elude the fulfilment of his engagements with Noor-ed-deen: and Shîrakoh, after maintaining himself for some time in Belbeis against the joint forces of Jerusalem and Egypt, was compelled to enter into a convention with Amaury and evacuate the country. But he was soon recalled by Shawer to deliver him from the vengeance of his new allies, to whom he had proved as perfidious as to those of his own faith; Cairo was closely besieged by the Franks, and the Fatimite caliph Aded Ledini'lla sent the hair of his women, the extreme symbol of Oriental distress, to implore the succour of Noor-ed-deen (1168). Shîrakoh again entered Egypt with an army, forced Amaury to retreat, and after beheading the double traitor Shawer, installed himself in the twofold office of vizier to the Fatimite caliph, and lieutenant of Egypt in the name of Noor-ed-deen; but dying the same year, was succeeded in his dignities by his famous nephew Salah-ed-deen. [SALAH ED-DEEN.]

While these events were passing in Egypt, Noor-ed-deen in person pushed his successes in Syria against the Christians, from whom he took Paneas and many other important places; Mesopotamia, ruled by his nephews, acknowledged his supremacy as head of the family; he was now, by his officers, absolute master of Egypt, and the fleets of Damietta and Alexandria were directed against the sea-coast of the kingdom of Jerusalem; but a religious conquest was yet wanting to complete his triumph; as a rigid adherent of the orthodox or Sooni sect of Islam, he reverenced the Abbaside caliph of Bagdad as the legitimate commander of the faithful; and the schismatic caliphate of the Fatimites, of which a phantom still remained secluded in the palace of Cairo, was an abomination which he determined to destroy. In obedience to his repeated commands, Salah-ed-deen (A.D. 1171, A.H. 567) substituted the name of the Abbasside caliph Mostadhi in the public prayers for that of Aded, who died eleven days after, in ignorance, it is said, of his deposition; the Sheah heresy was for ever abrogated in Egypt, and Noor-ed-deen, as the champion of orthodoxy, received from the gratitude of Mostadhi the direct investiture of Egypt and Syria as fiefs of the caliphate; two swords and two robes of honour were sent from Bagdad as emblems of his sway over two kingdoms; and he exchanged the title of emir, or sahib, for the higher appellation of sultan, which the etiquette of that age conceived to be attached to an immediate grant from the head of the Moslem faith. His name was recited with that of the caliph in all the mosques

* Abulfeda.—D'Herbelot places this event three years later, evidently confounding the death of Amad-ed-deen with that of his eldest son Seif-ed-deen Ghazi, prince of Moossool, and brother of Noor-ed-deen. Abul-Faraj dates it one year earlier than Abulfeda.

† Modjir-ed-deen is inadvertently called by Von Hammer, in his 'History of the Assassins,' the last of the Seljukides of Damascus; he was not of the Seljuki family at all, but the great-grandson of the Turkish emir Toghtekin (the Doldequin of the Crusaders), who supplanted the children of Dakak the Seljukide, at Damascus, in 1103 or 1104

throughout his dominions, and even in the holy cities of Mekka and Medina, which Tooran shah, brother of Salah-ed deen, had reduced as dependencies of Egypt; but the power and glory of Noor-ed-deen had now attained their highest pitch, the three remaining years of his life were unmarked by any memorable achievement, and disquieted by forebodings of the future downfal of his house by the ambition of Salah-ed-deen, who, though still ostensibly acting as his lieutenant, and making public professions of loyalty and obedience, had in fact become independent master of Egypt, and eluded or disregarded all the orders of his nominal sovereign. The reluctance of Salah-ed deen to join his forces with those of Noor-ed-deen in an expedition which the former had planned against the fortress of Karak, or Mont-Royal, at length brought these smouldering jealousies to the verge of an open rupture; and Noor-ed-deen was preparing* to march into Egypt to reduce or expel his refractory vassal, when an attack of quinsey terminated his life at Damascus, May 26, 1173 (Shawal 21, 569). His son Malek-al-Salah Ismail, a youth eleven years old, succeeded to the titular sovereignty of his extensive dominions; but was speedily stripped by Salah-ed-deen of Damascus and the greater part of Syria, and died eight years afterwards, reduced to the sovereignty of Aleppo and its dependencies, which were then absorbed, after an ineffectual attempt to claim them on the part of his cousins, the atabeks of Moossool, into the wide spread realm of Salah-ed-deen. Noor-ed-deen is described by Abulfeda as tall and well proportioned in person, of olive complexion, and with little or no beard; in the estimate of his character he has had the rare good fortune to unite the suffrages of his adversaries to those of his friends: William of Tyre ('Gesta Dei per Francos') describes 'Noradin' as 'a prudent and discreet man, who feared God according to the faith of his people;' and the eulogies of the Moslem writers prove that the titles of Malek-al-Adel (the just prince) and Noor-ed-deen (Light of the Faith), were not idle or groundless assumptions. With the constant practice of the two princely virtues most esteemed in the East, justice and liberality, he combined the strictest attention to the duties prescribed by his faith; and while wearing neither silk nor gold, nor expending on his dress or nourishment more than the fifth which was his just share of the spoil, he distributed every month 5000 dinars among the poor, and munificently maintained the hospitals and charitable foundations throughout his dominions. The Dar-al-Adl, or chamber of justice, which he established to control the excesses of his military chiefs and their retainers, was the terror of the great and the refuge of the poor; and such was the affection which his subjects bore to his memory, that, some years after his death, his name was invoked in the streets of Damascus by an oppressed suitor, who thus obtained from the reigning monarch the redress which had been previously denied him. Abulfeda sums up his character by declaring that his virtues were both too numerous and too splendid to be comprehended within the limits of his history; and the sentence of future ages, which has placed him among the number of the Moslem saints, has ratified the judgment of his contemporaries. (Abulfeda; Abul-Faraj; De Guignes, *Histoire des Huns;* D'Herbelot, *Biblioth. Orient.;* Von Hammer, *History of the Assassins.*)

NOUREDDIN (Malek-al-Afdal Noor-ed-deen Ali), the eldest of the seventeen sons of Salah-ed-deen; born A.D. 1170, A.H. 565. In the partition of his father's extensive dominions, which followed his death in 1193, Damascus and Southern Syria with Palestine fell to the lot of Noor-ed-deen; but in the dissensions which soon followed, he was stripped of his kingdom by his uncle Seif-ed-deen Abubekr (the Saphadin of Christian writers), and his brother Othman, sultan of Egypt (1196). In a poetical address to the caliph Nasser, he lamented the similarity of his own fate to that of the caliph *Ali* Ebn Abu-Taleb (his namesake) in being thus excluded from his rights by *Abubekr* and *Othman;* the caliph in his reply consoled him by the assurance that in him he should find the *Nasser* (protector) whom Ali had sought in vain; but the intercession of the caliph was unavailing to procure the restitution of any part of his territories; in 1198 however, on the death of his brother, the sultan of Egypt, Noor-ed-deen became *atabek,* or guardian, to his infant nephew Malek-al-Mansor, and attempted, by the aid of another brother, the sultan of Aleppo, to recover Damascus from his uncle; but the expedition failed, and Seif-ed-deen retaliated by invading Egypt, and expelled both the young sultan and his guardian. The unfortunate Noor-ed-deen now retired to Samosata, where he died, apparently without issue, A.D. 1224, A.H. 621. He is generally mentioned by Eastern writers under his assumed title of Malek-al-Afdal (the excellent prince).

NOUREDDIN, or NOOR-ED-DEEN ARSLAN SHAH, *atabek*, or prince, of Moossool and Mesopotamia, of the family of Zenghi, and grand-nephew of the famous Noor-ed-deen, sultan of Aleppo and Damascus, succeeded his father, Azz-ed-deen Massood, A.D. 1193, A.H. 589 (the year of the death of Salah ed-deen). During a reign of eighteen years, he re-established in some measure the declining power of his house, and compelled the minor princes of his family, who occupied appanages on the frontiers of his territories, to acknowledge his supremacy as lord paramount. An attack with which he and his relative Kootb-ed-deen, prince of Sandjar, were threatened in 1209 from the overwhelming power of Seif-ed-deen, brother of Salah ed-deen, was averted by the mediation of the caliph of Bagdad; and Noor-ed-deen died the next year, A.D. 1210, A.H. 607, regretted by his subjects as a mild and beneficent ruler. His son Azz-ed-deen, after a reign of between seven and eight years, was succeeded by an infant son bearing the title of Noor-ed-deen Arslan II., who survived only a few months. (Abulfeda; Abul-Faraj; De Guignes.)

NOUREDDIN (Malek-al-Manssor Noor-ed deen Ali), the second sultan of the dynasty of Tartar or Baharite Mamlukes in Egypt, was placed on the throne by the emirs after the assassination of his father, Ibek, A.D. 1257, A.H. 655, at the age of fifteen. (Makrizi. In the Latin version attached to Carlyle's edition of the 'Maured-Allatafet,' his age is inadvertently given as twenty-five, but the Arabic text agrees with Makrizi.) His short reign of two years was troubled by continual feuds among the Mamluke chieftains, and attempts on the part of the Ayoobite princes of Syria to recover the lost sway of their family in Egypt; and the apprehension of an irruption of the Moguls under Hulaku, who had taken Bagdad and destroyed the caliphate, showed the necessity of substituting a ruler of matured years and experience. The emir Kotuz accordingly assumed the reins of government, A.D. 1259, A.H. 657, and no more is heard of Noor-ed-deen.

NOVA SCOTIA, a British colony in North America, is situated between 43° 20′ and 46° N. lat. and between 61° and 66° 20′ W. long. It is surrounded by the sea, except at its north-western extremity, where the isthmus of Chignecto, which is nearly eleven miles across, unites it to New Brunswick. On the west side of Nova Scotia is the Bay of Fundy; on the south and east the Atlantic; on the north it is divided from the island of Cape Breton by the Gut of Canso, a strait about twenty-one miles in length, and varying from a mile to a mile and half in width; and from Prince Edward's Island by Northumberland Strait, which is about 14 miles wide at the narrowest place between Nova Scotia and the island. Its extreme length, from Cape Canso on the east to Cape St. Mary's on the west, is 280 miles. Its breadth varies from about 50 to 100 miles. It contains nearly 16,000 square miles, or almost two-thirds of the area of Ireland.

Coast.—Along the shores of the Atlantic, from Cape Canso to Cape Sable, the coast is rocky and rather high, though steep cliffs rarely occur. This coast-line is indented by numerous inlets, which penetrate into the rocky masses from three to fifteen miles, and form a great number of deep and safe harbours. The shores are lined with rocks and thousands of islets, between which and the coast during the most boisterous weather small vessels sail in smooth water, while there is a heavy sea in the open ocean. There is deep water almost without exception close to the rocks and islands and in the harbours. The most extensive of the inlets are Halifax Harbour; Margaret's Bay, which is less than two miles broad at the entrance, but widens to six miles, and is fourteen long; and Mahon Bay, separated from Margaret's by the lofty peninsula of Aspotagoen, which is about ten miles wide and twelve deep, and contains above 200 islands; and Shelburne Harbour. The coast along the south-western extremity of the province, between Cape Sable and Cape St. Mary's, resembles the southern shores. Cape St. Mary's on the south and Briar's Island on the north form the entrance of St. Mary's Bay, which is 35 miles deep and from

* D'Herbelot (*Bibl. Or.;* art. 'Noureddin') says, 'He entered Egypt at the head of a powerful army, carried the capital by assault, and constrained Saladin, brave as he was, to fly before him:' but this is one of those inaccuracies which disfigure that valuable compilation.

4 to 10 broad; Briar's Island, Long Island, and a peninsula called Digby Neck, separate it from the Bay of Fundy. The coast along the Bay of Fundy, from Briar's Island to the entrance of the Basin of Mines, runs in one continuous line, without a break except the Gut of Digby, by which the Annapolis Basin is entered. The Gut is narrow but leads to one of the most beautiful harbours of America, the Annapolis Basin, which extends, with a width varying between one and four miles, ten miles parallel to the Bay of Fundy. The shores of the Bay of Fundy are less rugged than the southern shore, but still bold and generally high. As there is no harbour on this coast east of the Gut of Digby, a pier has been erected at Black Point, which affords safety to coasting vessels. The Basin of Mines is one of the two great branches in which the Bay of Fundy terminates. Its entrance is through a strait about three miles wide, with bold and abrupt shores. It widens inside from eight to sixteen miles, and extends about fifty miles to the head of Cobequid Bay. The tides at full and change rise from 50 to 60 feet, and ascend the rivers to a distance of 15 miles. The shores of the Basin are low, and large tracts of very fertile land have been gained from the sea by embankments. The shores from the entrance of the Basin of Mines to Cape Chignecto, and from Cape Chignecto along Chignecto Bay to the Boar's Back, are high and rocky, but the innermost recess of Cumberland Basin has low shores, and extensive tracts of dyke-land have been formed here likewise. Chignecto Basin is the other great branch of the Bay of Fundy. It extends about twenty miles, with an average breadth of eight miles, and then divides into two minor branches, Cumberland Basin and Shepody Bay; the latter is in New Brunswick, and the former divides New Brunswick from Nova Scotia. The northern shores, along Northumberland Strait west of Pictou Harbour, are low, and partly muddy, partly sandy, except near Pugash Bay, where they are high. East of Pictou they are much higher, and from Cape St. George they are generally rocky and bold. Chedabucto Bay is 25 miles long and from 6 to 12 wide. The entrance is between Cape Hogan on Madame Island, which belongs to Cape Breton, and Cape Canso. It is altogether free from islands and cliffs.

Surface and Soil.—The lowest depression of the country seems to occur about 63° 30′ W. long., between Halifax Harbour on the south and Cobequid Bay on the north. The summit-level of the Shubenacadie Canal, which traverses it, does not rise to the elevation of 100 feet above the sea. The country to the west of that depression may perhaps on an average be about 300 feet above the sea-level. Its surface, though far from being level, does not appear to present any great inequalities, and has a hilly character only in that part where it descends towards the west, north, and east. The ascent from the southern and rocky coast is very gradual. The most hilly and probably the most elevated district occurs towards the most western extremity, west of Lake Rossignol, in the heights called the Blue Mountains. This district seems to extend northward to the vicinity of Annapolis Basin. Along the Bay of Fundy two ridges of hills of moderate elevation enclose the valley of the Annapolis river. The southern of these ridges probably does not rise above the table-land occupying the interior. On the eastern edge of this table-land, at a distance of from eight to ten miles from the Basin of Mines, several high hills occur, as Horton Mountain and Ardoise Mountain; the latter is considered to be the most elevated land in Nova Scotia, and rises to about 700 feet above the sea. The table-land is unknown as far as concerns the qualities of the soil, no settlements having been made on it; but it appears that the greatest part of it is covered with forests, which contain timber fit for ship-building and other purposes. A great number of lakes are dispersed over its surface, among which Lake Rossignol is said to be thirty miles long. The lakes are most numerous between Annapolis and Liverpool, where they constitute a water communication across the country. The tract along the southern coast, and for several miles inland, is generally naked and barren, the soil being occupied by rocks and stones: in some places it is covered with low trees and bushes, but in general it is unfit for cultivation. In a few places, where the land has been cleared of the stones, moderate crops of barley and oats are obtained. At the head of the bays and on the lower course of the rivers there are tracts of alluvial soil which yield good crops; but these cultivable tracts constitute a very small portion of the whole, and hence the inhabitants of the scattered settlements of this country are almost exclusively occupied with fishing and preparing and bringing down the timber from the interior. The vicinity of Halifax constitutes an exception, though here also the soil is of an indifferent quality. The country contiguous to the western coast between Cape Sable and Cape St. Mary, though generally rocky and sterile, contains a much greater proportion of arable land. The country improves considerably on the shores of St. Mary's Bay, and still more along those of the Bay of Fundy. Though the elevated ridge which runs along this bay is also stony, it has a superior soil, and gives abundant crops of wheat and other grains, and has extensive orchards: its cider is much esteemed. The valley through which the Annapolis River flows is also equally fertile, but cultivation has not extended from it to the more elevated country lying south of the valley.

The country surrounding the Basin of Mines is the most fertile and the best settled portion of Nova Scotia. It contains several thousand acres of the most fertile marsh or dyke lands, which owe their origin to the extraordinary velocity with which the tides rush into the bay, depositing vast quantities of alluvial matter on the shore. Where it has been possible to exclude the tides by embankments, these tracts have been converted into the finest meadows, and may also be cultivated with advantage. There are also extensive alluvial tracts along the rivers which are very fertile; and even the uplands, which occupy the tracts between the river courses, though less fertile, repay the labour bestowed on them. A few sandy tracts occur, but they are of comparatively small extent. The peninsula which divides the Basin of Mines from Chignecto Basin has a stony soil, but a considerable degree of fertility. At the innermost corner of Cumberland Basin there are also marshes, though less extensive than those on the Basin of Mines. They are likewise partly produced by the tides, and partly by the alluvial deposit brought down by several small rivers which empty themselves into Cumberland Basin.

The eastern portion of Nova Scotia resembles in most respects the western, constituting in the interior a table-land, from 200 to 300 feet above the level of the sea, and with a slightly irregular surface. It is likewise for the most part covered with forest-trees, and contains several lakes in the eastern districts. The high lands appear to extend with undiminished elevation to the vicinity of the northern coast; but along the northern coast they terminate at 12 miles from the shores, and the interval is occupied by a long slope, broken into hills and dales. A portion of the peninsula between the Basin of Mines and Northumberland Strait is occupied by a cluster of hills, called the Cobequid Mountains. The soil of the country contiguous to Northumberland Strait, though not of first-rate quality, is rich enough to repay the labour bestowed on it. This country also contains rich mines of coal and iron. These advantages, united to a very profitable fishery, and the vast forests of timber-trees, will give some idea of the value of this country. The country adjacent to St. George's Bay, the Gut of Canso, and Chedabucto Bay, is much less fertile, and the inhabitants are mostly engaged in fishing. The coast from Cape Canso to Halifax Harbour is by far the most rugged and barren in Nova Scotia: it is also more thinly settled than the rest, and the number of agricultural settlements is very small. The scattered population are occupied in the timber-trade and fishery.

Rivers.—The number of rivers is very great, but their course is short. Nearly all of them form good harbours at their mouths, though they are generally only fit for moderate sized vessels. Most of the rivers have rapids not far from the sea, which however do not prevent them from being used to float down the timber from the interior. The most remarkable are the Annapolis River and the Shubenacadie. The Annapolis River originates in the high land which forms the southern side of the entrance of the Basin of Mines, and runs west-south-west about 90 miles. It becomes navigable about 25 miles from the Gut of Digby, which may be considered as its mouth. The Shubenacadie River rises in a chain of lakes situated north of Halifax, and beginning about two miles from that town. The most northern of these lakes is called the Great Lake: the river issuing from it runs northward 55 miles, when it discharges itself into the Basin of Mines. At its mouth it is a mile wide; the tide ascends more than 10 miles, and it is navigable for about 30 miles more. This river and its lakes supply the Shubenacadie Canal with water, by which a

communication between the Bay of Fundy and Halifax has been established for ships drawing not more than eight feet of water.

Climate.—The climate is colder than that of England, but it varies considerably in the different parts of the country. Along the southern and western coast there are several harbours which are never frozen; but the harbour of Pictou, on Northumberland Strait, is usually closed by ice for four months. In Argyle Bay, at the western extremity of the peninsula, the thermometer sometimes sinks to zero, and in summer it rises, though rarely, above 80°; yet the mean annual temperature is stated to be 48°, or only two degrees less than that of London. Along the northern coast however the frost generally continues from the end of December to the beginning of April, and sometimes longer; and during this time there are very heavy falls of snow. The spring, as in the northern countries of Europe, is very short. As soon as the frost and snow disappear, the country is clothed with a vigorous vegetation, and the heat becomes sensible, though it is never oppressive, even in August, when it is greatest. The autumn is the finest portion of the year, on account of the constancy of the weather and the moderate temperature. In November or December the rains set in: these months and April are the most rainy part of the year, but in general the quantity of rain which falls is moderate. Fogs prevail on the southern shores and at the entrance of the Bay of Fundy in June, July, and August, but they do not extend far inland. The climate is everywhere very healthy.

Productions.—Wheat is grown on the better lands, but if not cultivated with care it does not succeed. The quantity grown is not sufficient for the consumption of the colony, and a considerable quantity of flour is imported. Indian corn is extensively cultivated along the Bay of Fundy, though it is not much used as an article of food. Rye, oats, barley, and potatoes are the principal articles which are raised. Turnips, beans, and buckwheat are also generally cultivated. As the cattle are housed in winter, the culture of grasses is one of the principal objects of agriculture. There are extensive orchards along the Bay of Fundy and in the country which surrounds the Basin of Mines; and the cider, which forms a considerable article of export, is inferior to none in America. Peaches and grapes ripen in ordinary seasons without any artificial aid.

Cattle and sheep are very numerous, especially in the country about the Basin of Mines and along the northern shores. Beef and butter make a considerable article of export. The fleece of the sheep, which is tolerably fine, is used for domestic purposes. Horses are not numerous, and the breed is indifferent. Hogs are tolerably numerous.

The forests are one of the sources of the wealth of the country; they consist of pine, birch, oak, hemlock, beech, ash, maple, and elm, all of which make articles for exportation: there are other trees of great beauty, but less value. The wild animals are the moose-deer, bear, tiger-cat, fox, marten, otter, mink, beaver, musk-rat, porcupine, racoon, weasel, squirrel, and hare; all of which, except the two last, have decreased very rapidly in number. The lakes and rivers abound with fish, and the sea along the coast contains abundance of cod, mackerel, herring, shad, alewives, salmon, halibut, sturgeon, sole, and some other fish of less value; lobsters, oysters, and different kinds of shell-fish are abundant. Perhaps one-third of the population subsists on the produce of the fisheries, which are carried on along the shores and on the coast of Labrador.

The eastern portion of Nova Scotia is very rich in minerals. Coal has been discovered at least in ten places between the isthmus of Chignecto and Merigomish, and the great coal-field of Pictou occupies an area of more than one hundred square miles; the seams vary in thickness from one to fifty feet; the seam at the Albion coal-mine is more than fifty feet in thickness; it consists of several distinct layers; the upper or main layer being generally thirty-six feet thick. Great quantities of coal are shipped from Pictou to the United States for the use of steam-vessels. Iron-ore abounds in the same district, but it is not worked; it is also found in abundance in the vicinity of the Annapolis Basin, on the banks of the small river called Moose, where it is worked by the Annapolis Iron Mining Company; the ore is very good. Indications of copper and lead occur along Northumberland Strait. Above 100,000 tons of gypsum are annually shipped to the United States for manure; it occurs in several places, and is extensively worked on the shores of the Basin of Mines, Cumberland Basin, and St. George's Bay. Salt-springs are numerous in the north-western district, west of a line drawn from the innermost recess of Cobequid Bay to Pictou. Slate, freestone, and grindstone are worked in several places, principally for domestic use; grindstones are annually exported to the amount of 10,000*l.* to the United States.

Population, &c.—The population of the peninsula of Nova Scotia, which in 1817 amounted to 84,913, had increased to 123,848 in 1827, since which year no census has been taken: this increase was equal to rather more than 4¼ per cent. annually, some part of which was caused by immigration, but to what extent is not known. The division of the population among the different counties and districts was, in 1827, as follows:—

	Males.	Females.	Total.
Halifax County:—			
Peninsula of Halifax	6,867	7,572	14,439
District of Halifax	5,178	4,959	10,437
District of Colchester	3,921	3,782	7,703
District of Pictou	7,262	6,687	13,949
Hants County	4,520	4,107	8,627
King's County	5,293	4,915	10,208
Annapolis County	7,491	7,170	14,661
Shelburne County	6,133	5,885	12,018
Queen's County	2,187	2,038	4,225
Lunenburg County	4,846	4,559	9,405
Cumberland County	2,853	2,563	5,416
Sydney County	6,685	6,075	12,760
	63,536	60,312	123,848

The number of births in the year 1827 was 4563, or 1 in 27; the number of marriages was 945, or 1 in 131, and of deaths 1908, or 1 in 65, which last proportion, if the registers are correctly kept, indicates great salubrity in the climate.

The population of the colony is of a mixed character. It consists of four distinct classes: the Indians, or aborigines—part of the tribe of Micmacs—who do not exceed 600 in number; free negroes, of whom there are about 2000; Acadians, descendants of the French, by whom the country was partially settled before its conquest by the English, and whose numbers do not much exceed 6000; the remaining class, who form the main body of the population, are the descendants of colonists from Germany, of refugee royalists from the former British provinces of North America, and emigrants from all parts of the United Kingdom, but more especially from Scotland. The Acadians are Roman Catholics; they settle together as much as possible, preserve their religion, language, and customs, and never intermarry with their Protestant neighbours: the descendants of the ther nations are so mixed together that all distinctive haracteristics are lost.

Acadia was the name given to Nova Scotia and the adjacent countries when they were under the dominion of France.

The province is divided into nine counties, exclusive of the island of Cape Breton, which is included within the government. These counties, which have already been enumerated, are subdivided into 43 townships, which are not all of equal extent; their inhabitants meet together to authorise the raising of money for local purposes.

Halifax, the capital of the province, in 44° 40′ N. lat. and 63° 38′ W. long., is built on the declivity of a hill, the summit of which is 240 feet above the sea. It stands at the western side of the harbour, which is spacious, safe, and accessible at all seasons of the year. There is space within it for 1000 vessels to ride in safety. It is entered by a creek sixteen miles long, which terminates in a sheet of water called Bedford Basin, the area of which is ten square miles. The mouth is protected by a small island forming two passages into the harbour, one of which, the eastern passage, can be used only by small vessels. Opposite to the town is another small island, George Island, which is strongly fortified. The town is regularly laid out, and the streets are for the most part paved or macadamised. Including the suburbs, the town is two miles long and half a mile broad; it contains 2 churches, 1 Roman Catholic chapel, and six chapels for Protestant dissenters. The 'Province Building,' in the centre of the town, is a handsome well-built edifice of freestone, 140 feet long, 70 feet wide, and 42 feet high It contains the chambers of meeting for the legislative bodies, the custom-house, the offices of the provincial govern-

ment, and the superior law courts. The court-house, in which the courts of Common Pleas and the Sessions of the peace are held, is a plain brick building. It contains an exchange-room for the merchants. Halifax is the principal naval station in British America, and in time of war its possession is of great importance: it contains a well-appointed naval arsenal. At the last census, in 1827, the town contained 1580 houses; since that time it has been much improved and enlarged. It is the seat of government for the province, and carries on a considerable trade with the United Kingdom, the West India Colonies, and the United States. The post-office packets which convey the correspondence between Europe and British America arrive at Halifax from Falmouth once in every month.

Opposite to Halifax, on the eastern side of the harbour, is the small town of Dartmouth; it was a thriving place during the war, but has not increased since. A steam-boat is constantly employed for the conveyance of passengers from one town to the other.

Truro, a town containing about 100 houses, mostly built of wood, stands at the head of the Basin of Mines. It contains a church and a court-house, and returns one member to the House of Assembly.

Pictou, on the Straits of Northumberland, opposite to Prince Edward's Island, contains a population above 3000. There are an Episcopal, a Catholic, and two Presbyterian chapels. A considerable trade is carried on in lumber and coal; as many as 100 vessels have been loaded with timber for England in a single year. The harbour has a bar at its mouth, but within it is capacious, and has from 5 to 9 fathoms depth of water.

Dorchester is situated a mile above the navigation on Antigonish river. It has a considerable trade in proportion to its size, and contains a court-house, a Baptist, a Presbyterian, and a Roman Catholic chapel.

Guysborough stands on the western side of Milford Haven, at the head of Chedabucto Bay. It contains a court-house, an Episcopal church, Roman Catholic and Protestant Dissenters' chapels.

Amherst stands near the isthmus which divides the Bay of Fundy from Northumberland Strait. It is a small but thriving place.

Windsor, the county town of Hants, stands at the confluence of the St. Croix and the Avon, about 40 miles north from Halifax. It contains a college, an academy, an Episcopal church, a Roman Catholic chapel, and places of worship for many sects of Protestant Dissenters.

Chester is a thriving town on the north side of Mahon Bay, about 9 miles from its entrance. It contains several saw, grist, and fulling mills, and carries on a considerable lumber trade. Many of its inhabitants are engaged in the fishery.

Lunenburg, a regularly built town, contains about 300 houses and four churches and chapels. It carries on the lumber trade with the West India Colonies.

Liverpool, the shire town of Queen's county, is well built. It stands on the west side of the harbour. The inhabitants are mostly engaged in the lumber trade and fishery, which afford exports to Europe and the West Indies. Liverpool harbour is never frozen, and is accessible at all seasons of the year.

Annapolis, the county town of the county of the same name, stands on a peninsula which projects into the Gut of Digby. It has not advanced in size or population for many years. Annapolis was the capital of the province under the French, who called it *Port Royal*. It continued to be the seat of government until 1750, when Halifax became the capital of the province.

Shelburne, in the county of that name, was built by American loyalists immediately after the recognition of the independence of the United States. Within a year after it was founded, the town is said to have contained 12,000 inhabitants, but it soon began to decline, and is now almost deserted. The town stands at the northern extremity of an inlet 10 miles deep and two miles wide. The few inhabitants that remain are employed in fishing and ship-building.

Yarmouth, also in Shelburne county, on the west coast of the province, contains about 100 houses, and consists of one street nearly two miles long, but the dwellings are not placed close together.

The affairs of the province are administered by a lieutenant-governor, subordinate to the governor-general of British North America, a council of 12 members appointed by the crown, and a house of assembly, consisting of 41 members, elected by forty-shilling freeholders. The assembly is elected for seven years, but may be dissolved or prorogued at the pleasure of the lieutenant-governor: it must meet every year.

The bishop of Nova Scotia and the chief-justice of the province are ex-officio members of the council: the latter acts as its president. The laws are administered by a court of queen's bench, which holds its sittings in Halifax, and by district courts, as in the provinces of Canada. The common and statute law of England are in force, together with the statutes passed by the provincial parliament, and allowed by the queen in council.

The militia of the province, in 1836, comprised 1063 commissioned officers and 22,488 non-commissioned officers and privates.

The exports of the province consist principally of lumber and the produce of the fisheries. Of the first description of produce there were shipped, in 1836, of pine, birch, and ash timber, masts, deals, shingles, and staves, to the value of 115,620*l.*, and the shipments of cod, herrings, mackerel, salmon, and fish oil, amounted to 186,908*l.* In the same year there were exported 31,489 tons of gypsum, 42,587 tons of coals, and agricultural produce, valued at 26,063*l.* The total value of exports was 446,097*l.* The imports, which consisted principally of British manufactured goods and West India produce, amounted in value to 733,540*l.* Included in this amount there were 347,176 bushels of salt, and agricultural produce, valued at 85,558*l.*

The shipping that entered and cleared from the province in 1836 was:

	Inwards.		Outwards.	
	Ships.	Tons	Ships	Tons.
Great Britain	108	29,544	112	30,931
British Colonies	2,295	147,781	2,540	170,407
United States	965	97,689	902	90,399
Foreign States	36	6,119	20	2,783
	3,404	381,133	3,574	294,520

(M'Gregor's *British America*; Bouchette, *British Dominions in North America.*)

NOVA ZEMBLA, a corruption of the Russian name of Novaïa Zemlïa (new land), designates an island situated in the Arctic Ocean, between 70⅓° and 76½° N. lat. and 52° and 66° E. long. It extends in length from south-south-west to north-north-east nearly 400 miles, but its width, so far as it is known, does not exceed 50 miles on an average, though in our maps it still occupies double that extent from west to east. It is divided from the island of Waigats, which lies farther south, by the Strait of Kara, which is more than 30 miles wide. Zembla properly consists of several islands; at least it is known that between 73° and 74° N. lat. a strait, called Matotshkïn Shar, divides it into two islands, and it is very probable that some inlets, farther north, are likewise straits; but it has hitherto been found impossible to advance far into them, since even in the midst of summer they are closed with ice. The island south of the Matotshkin Shar has been recently surveyed by Russian seamen, but more than one-half of the eastern coast of the island north of the strait has always been found so closely beset with ice, as to prevent all farther progress. The western coast, up to Cape Nassau, the most northern point of the island, is known. It appears that the wide arm of the sea which lies between Novaïa Zemlïa and the extensive headland separating the Bay of Kara from the wide gulf into which the Oby river flows, is always encumbered in its northern part with close masses and fields of ice. No vessel, and not even a boat, has yet succeeded in making its way to the east far enough to reach the gulf of the Oby.

The land on the western side of the island is mountainous, rising from a steep and bold shore to the height of 1000 and 2000 feet. The highest mountains are near the western entrance of the Matotshkin Shar, where several summits attain more than 2000 feet above the sea-level. The most elevated mountain is on the strait itself, and is 3475 feet high. The eastern shores are comparatively level, especially towards the south. Though the heat in summer is very great, owing to the long continuance of the sun above the horizon (four months and a half at the northern extremity), the soil thaws only to the depth of between six inches and two feet and a half, and at that distance from the surface ice is always found. The vegetation, which

covers some parts of the surface, consists only of lichens and mosses. White bears, foxes, walrusses or morses, and seals abound, as well as rein-deer and water-fowl. The islands are frequently visited by fishermen from Arkangel and other places in order to take the walrus. Nova Zembla first became known by the voyage of Steven Burough (1556), but had previously been visited by the Russians. The Dutchman, William Barentz, passed the winters of 1596-7 in Icy Haven, near the most northern extremity of the island. The Russian government in recent times has sent several expeditions to explore the islands, as already observed, but they have not yet completely succeeded in this object. (Barrow's *Chronological History of Voyages into the Arctic Regions*; *London Geog. Journal*, vol. viii.)

NOVACULI'NA (Benson), the name of a conchifer belonging to the *Solen* family. [SOLENIDÆ.]

NOVA'LIS, the literary name assumed by Friedrich von Hardenberg, who was born in 1772, at a family estate in Mansfeld. His father, Baron von Hardenberg, had been a soldier in his youth, and was director of the Saxon salt-works. Himself and his wife, the mother of Novalis, belonged to the religious society of Hernhuters. Novalis was the eldest of eleven children, and was very delicate in his earlier years. He was of a dreamy nature, and displayed no extraordinary talent, till a dangerous illness, which attacked him in his ninth year, and could only be cured by painful remedies, awoke him from a kind of intellectual slumber, and he appeared thenceforward as a lively and intelligent child. His diligence was great, and in his twelfth year he possessed considerable knowledge of the Latin and some acquaintance with the Greek language. He displayed a great predilection for tales (*Mährchen*), some of which he invented for the amusement of his brothers. In 1789 he attended a gymnasium, and in the following year went to study at Jena, where he remained till 1792, when he went with his brother Erasmus to the university of Leipzig. In the succeeding year he removed to Wittenberg, where his studies were completed.

At this time he became acquainted with Frederic Schlegel, and also with Fichte, whose system of philosophy, called the *Wissenschaftslehre*, he studied with ardour. On leaving Wittenberg he went to Arnstadt, to attend for the first time to practical business. He soon became acquainted with a neighbouring lady, called by his biographer Sophia von K., of whom he became violently enamoured. In 1795 he went to Weissenfels, and was made auditor of the department of which his father was director. The death of Sophia and of his brother Erasmus, both in the year 1797, was a great shock to Novalis; he however pursued his business with activity, and it is about this time that his 'Hymns to Night' are supposed to have been written.

In 1798 he was betrothed to a lady called Julia von Ch., and about this time he wrote his 'Pupils at Sais.'

Returning to Jena, he became acquainted with August Wilhelm Schlegel, and with Tieck, the romance writer, and author of the biography to which we are indebted for all the information that we have respecting the life of Novalis. In 1800 the romance 'Heinrich von Ofterdingen' was commenced by Novalis, and was, as he explains in a letter to his friend Tieck, designed to be an apotheosis of poesy. This singular work was never finished, although the plan of its conclusion is preserved. The hero, Heinrich, is an old German poet, supposed by some to be the author of the 'Nibelungen-lied,' and the purpose of the work is to show the whole world, with every profession and pursuit, on its poetical side. It would little suit most romance readers, as the story is too wild to be interesting, and is merely a thread to connect the author's own thoughts and opinions. The conclusion of the work, as given by rough notes, was to have been eccentric even for a German enthusiast. Heinrich was to have come into a land where men, beasts, minerals, and even tones and colours held converse, where the world of tales (Märchenwelt) was to become visible, and the real world to be considered as a tale. It may be observed that Novalis regarded the *Mährchen*, or popular traditions, with singular respect, and discerned in them, or fancied he discerned, a deep meaning. He was accustomed, says his biographer, to regard the most ordinary occurrence as a miracle, and the supernatural as something ordinary.

In 1800 he was subject to spitting blood, and fell into a weak state. The books which he then constantly studied were the Bible, and the works of Zinzendorf and Lavater. He loved to talk of all his projected works, and professed that he now for the first time knew what poesy was, and designed to re-write 'Ofterdingen.' On the 19th March, 1801, he died, in the presence of his friend Frederic Schlegel, before he had completed his 29th year.

Novalis is a writer who will either be read with some degree of enthusiasm or not read at all. Hence while almost idolised by the partisans of the romantic school, he is mentioned with a kind of benevolent contempt by the opponents of that school. His imagination and enthusiasm are most boundless: he darts from prodigy to prodigy with a celerity that cannot be followed, unless the reader allows himself to sympathise with the author. The effects of the ideal philosophy of Fichte, and the love of tales so predominant in the romantic school, are plainly discernible in Novalis's works. He had literally constructed an unreal world of his own, and seems to have breathed an atmosphere utterly unlike that of the actual world. A desire of combining religious fervency with philosophy is also apparent; and thus that combination of speculation and enthusiasm which is found in the writings of the Alexandrian Platonists and the Mystics was very acceptable to him. The 'Hymns to Night,' and the latter part of 'Ofterdingen,' are equally remarkable for the vast power manifested in the construction and the dimness of the construction itself, while here and there the acuteness of some remarks is not to be mistaken. The 'Pupils at Sais' is another fragment of a romance, the object of which was to reveal Novalis's views of physical science, for which and mathematics he had a great taste. If however the works above mentioned are remarkable for singular combination, his spiritual songs ('Geistliche Lieder') are no less so for their perfect simplicity and pure spirit of devotion. They are indeed complete gems of religious poetry. The posthumous works of Novalis contain numerous aphorisms, which show the direction of his studies, a most remarkable turn of thought, and a love of startling paradox, combined with singular acuteness. The whole works of Novalis were collected and edited by his friends Tieck and F. Schlegel, with a biography prefixed by the former. The edition has been reprinted at Paris, in one vol. 8vo.

NOVA'RA, the Province of, in the Sardinian territories, is bounded on the north by the province of Pallanza, on the east by the river Ticino, which divides it from Austrian Lombardy, on the south by the province of Mortara, and on the west by the provinces of Vercelli and Val di Sesia. It is about 35 miles in length and 15 in breadth, and consists in a great measure of a plain between the rivers Sesia to the west and Ticino to the east, which is crossed in its length from north to south by the Agogna, likewise an affluent of the Po. The northern part of the province extends to the hills which border on the lakes Maggiore and Orta. The population is 134,000, distributed among 93 communes. (Serristori, *Saggio Statistico d'Italia*.) The country forms part of the plain of the Po, and is very productive, especially in corn, rice, wine, hemp, and silk. Abundance of poultry and pigs are reared.

The chief town, Novara, a bishop's see, is situated on a hill at the foot of which flows the Agogna; it is fortified, and the circumference of its ramparts is nearly two miles. Seen from a distance, the town with its numerous steeples appears more considerable than it really is. It is however a place of some importance, though old looking and irregularly built: it has many churches and convents, a gymnasium, a clerical seminary, two hospitals, a library in the Chapter-house, several palaces, especially that of the noble family Bellini, a handsome square, a theatre, and 15,300 inhabitants, including its communal territory; a considerable trade is carried on in silk and agricultural produce. The church of S. Gaudenzio contains several valuable paintings. Count Prina, minister of finance of the late kingdom of Italy under Napoleon, who was murdered by the mob at Milan in 1814, was a native of Novara. Luigi Bossi, the author of the only General History of Italy existing, in 19 volumes 8vo., and of several other works, was also a native of this province. The high road from Turin to Milan passes through Novara.

The other towns of the province are—1, Borgomanero, in the north part of the province, not far from the lakes Maggiore and Orta, a well-built bustling little town, with 6400 inhabitants; 2, Oleggio, near the right bank of the Ticino, with 6900 inhabitants; 3, Trecate, in the south part of the province, with 4200 inhabitants; 4, Camere, with 3400 inhabitants; 5, Orta, on the eastern shore of the lake of the

same name, with a sanctuary on the hills above, dedicated to St. Francis, is much frequented by the country-people around. The pretty lake of Orta, which is partly in the province of Novara, is ten miles in length from north to south, and little more than a mile in breadth. Its southern extremity is about 20 miles north of Novara. Its outlet is at the opposite or northern end, from which the waters flow into the Lago Maggiore, which is seven miles distant to the east. The banks of the lake of Orta are hilly and pleasant, and covered with villages, hamlets, and handsome country-houses. Many of the inhabitants of this district emigrate to foreign countries, and especially to Spain, whence some return with the savings of their industry. In the middle of the lake is the little island of S. Giulio, with a very handsome church, a palace belonging to the bishop of Novara, and some other buildings and gardens. This island was once fortified, and is mentioned in the wars of the middle ages.

The actual province of Novara is only a part of the former territorial division, called Il Novarese, which comprised the whole country between the Sesia, the Ticino, Lago Maggiore, and the Alps, including numerous alpine valleys. It was frequently a subject of contention in the Italian wars. It formerly belonged to the duchy of Milan; it was given up by Austria to the king of Sardinia by the peace of Vienna in 1735; was reunited by Bonaparte to the Milanese, and formed part of the kingdom of Italy; and was restored to the king of Sardinia in 1815. The upper part of this interesting region is known by the name of Valli di Novara.

NOVA'RA, VALLI DI, or ALTO NOVARE'SE, a geographical denomination which designates a large tract of country consisting of numerous valleys in the Lepontian Alps, which are formed by mountains extending from the sources of the Anza at the eastern foot of Mount Rosa to those of the Tosa or Toccia at the foot of Mount Gries, which belongs to the group of the St. Gothard. All the waters from these valleys flow into the Lago Maggiore. A considerable alpine stream, the Toccia or Tosa, flows through a long tortuous valley from north to south, about 45 miles in length to its æstuary in the lake. The upper part of the valley of the Tosa is called Val Formazza, and is from 3000 to 4000 feet above the level of the sea. Lower down, the valley takes the name of Valle Antigorio, which extends as far south as the bridge of Crevola, at the opening of the transverse valley Di Vedro, through which the great Simplon road passes. South of Crevola the main valley assumes the name of Val d'Ossola or Oscella, which it retains as far as its opening upon the Lago Maggiore. Several lateral valleys, descending from the high Alps, open into the valley of the Tosa from the west, called respectively Val di Vedro, Val Bugnanco, Val Antrona, and others from the east, such as the Val Vigezza, which extends upwards to the ridge which divides the Sardinian territory from the Swiss canton of Ticino. A road leads from Domo d'Ossola to Locarno by the Val Vigezza; the highest pass of it, near Centovalli, is 3000 feet above the sea.

The whole of this alpine district, including the main valley of the Tosa, and the various lateral valleys which open into it, is now constituted into one administrative province of the Sardinian states, called Ossola, from the name of the chief town, Domo d'Ossola, which is well built and cheerfully situated in a broad part of the valley: it has about 1500 inhabitants. The traveller who comes from Switzerland by the Simplon finds at Domo d'Ossola the first appearance of an Italian country, Italian manners, and Italian sky. The province of Ossola contains 33,000 inhabitants, distributed among 64 communes. (Serristori.)

South of the province of Ossola is the province of Pallanza, which also forms part of the Valli di Novara, and consists of a fine strip of land along the western coast of the Lago Maggiore and of several valleys extending on both sides of the lower Tosa. The longest valley is that of the Anza, a mountain-stream which descends from Mount Rosa, and after an eastern course of nearly 30 miles enters the Tosa near Vogogna. The upper part of this valley, which is in some parts more than 4000 feet above the sea, is called Val Macugnaga; several mountain-passes, practicable only in summer, lead from it into the Valais. The inhabitants of Val Macugnaga speak a dialect of the Swiss German, and they seem to be of a race akin to that of the Valais. Their houses are built of wood, and their country is rugged and poor. The lower or eastern part of the valley of the Anza, down to its confluence with the Tosa, is called Val Anzasca, and has quite a different appearance. The vine is cultivated here, and the hamlets are built after the Italian fashion. The women of the Val Anzasca are noted for their comeliness, and their refined appearance and manners, which are superior to those of their neighbours. Their dress is gay and fanciful, and recalls to mind that of the women of the Greek islands. The Val Stroma, south of the Val Anzasca, opens to the northern coast of the lake of Orta.

The principal towns of the province of Pallanza are—1, Pallanza, on the banks of the lake Maggiore, opposite the Borromean Islands, which has the Tribunale di Prefettura, or provincial court, a royal college, and about 2000 inhabitants. 2, Intra, north of Pallanza, which has 3300 inhabitants, and carries on some trade by boats on the lake. 3, Arona, with 2000 inhabitants. [ARONA.] The population of the province is 64,800, distributed among 98 communes.

NOVATIANS, a Christian sect which arose in the middle of the third century. Their leader Novatianus (or as Lardner prefers to call him, following the Greek writers, Novatus), was a presbyter at Rome, who, after the death of Fabian, bishop of Rome (A.D. 250), and the election of Cornelius as his successor (A.D. 251), refused to submit to the authority of Cornelius, and procured from three bishops his own ordination as bishop of Rome. Upon this Cornelius called a council at Rome, and excommunicated Novatian and his adherents, who immediately formed a distinct sect, and thus became schismatics. But Novatian is also reckoned as a heretic, on account of his opinions respecting those Christians who after baptism had fallen into open sin, whom he declared that the church had not the power to admit again to her communion, even though they should give satisfactory evidence of their repentance. In consequence of this strictness of discipline his followers obtained from the Greek writers the name of Cathari (καθαροί, that is, Puritans. In other points the opinions of Novatian did not differ from those of the Catholics. Some writers charge him with unsound opinions respecting the Trinity, but there is ample evidence to disprove this accusation. His later followers condemned second marriages. Novatian is highly spoken of by the ecclesiastical writers for his learning, eloquence, piety, and exemplary conduct. It is true that Cornelius accuses him of very disreputable conduct in the means by which he obtained ordination, and in other matters; but these are the statements of a violent opponent, couched in very unmeasured language, and some of them are highly improbable.

Novatian was assisted in his proceedings by Novatus, a presbyter of Carthage, whom Cyprian calls the author of the schism; and he numbered also among his followers some bishops and several presbyters. His sect spread widely, and embraced at various times some men of very high character and attainments. The Novatians were included in the severe edict which Constantine issued, about A.D. 331, against the Valentinians, Marcionites, Cataphrygians, and other heretics; but it is thought that through the influence which some of their leaders had with the emperor, they suffered little on that occasion. Under the Arian emperors they shared in common with the orthodox in the persecutions which they endured; but under the Catholic emperors they appear to have enjoyed repose on account of their orthodox opinions on the Trinity. This sect declined in importance during the fifth century.

Novatian wrote several works, of which there remain a treatise, 'Of Jewish Meats;' another, 'Of the Trinity,' or 'Of the Rule of Faith;' a letter of the Roman clergy to Cyprian, written during the vacancy of the see of Rome, after the death of Fabian, in August, 250. There is another letter to Cyprian, written in the same year, but it is not certain that Novatian was its author. Jerome gives a catalogue of Novatian's works, among which are two, 'Of Easter,' and 'Of Circumcision.' The Novatians asserted that their leader suffered martyrdom, but of this we have no proof.

(Eusebius, *Hist. Ecc.*, vi. 43; Hieronymus, *De Vir. Illust.*, chap. 70; Epiphanius, *De Hæresiis*; Lardner's *Credibility*, pt. ii., chap. 47; Mosheim's *Ecclesiastical History*, Neander's *Kirchengeschichte*.)

NOVEL. It will be as well to draw a distinction at starting between romances and novels; the one term includes all fictitious narratives of the kind called romantic, whether in prose or verse; the other is used to designate that species of romance which is most common at present,

Those who are accustomed to look upon all literary composition as depending for its changes on that prevalent tone and character of society, which are usually known by the name of the spirit of the age, will easily allow that imaginative writings are not excepted from the general rule; that they are in fact the expression of the age in which they appear. It remains then for us to find out, if possible, what relation they bear to that prevalent tone of society to which we have already alluded, as the spirit of the age.*

A comparison between the novel and other imaginative compositions, such as narrative, lyrical, or dramatic poetry, will show that while the latter depend for their effect on our tastes and sympathies as men, the former requires us to be interested in the circumstances of the plot as well as in the characters themselves. The interest excited by the 'Iliad,' and by 'Hamlet,' exists independently of our knowledge of the history of Troy or of Denmark; and hence the universal celebrity of those poems. They have been read and will be read with delight, not only by one age or country, but by all. They exhibit pictures of *humanity*; and, as such, do not depend for their popularity on the fact of their readers being interested by the customs which they describe or the scenes in which the stories are laid. It is as a man, not as a prince of Denmark, that we are interested in Hamlet. If Hector and Andromache had been natives of the South Sea Islands, we should have read the description of their parting with as much sympathy as we do now.

In novels, on the contrary, we require, in order to be fully satisfied, to be interested in the circumstances, the dress, manners, and language of the characters, as well as in the characters themselves. But these circumstances, the outward dress of the story, are precisely those parts in which the peculiarities of age and country are developed—those which render the hero of the novel an individual, not the representative of a class. If we acknowledge thus far, we shall see that the interest which the novel excites depends on more causes than that of the narrative or dramatic poem. But being a more intense, it is also a more confined interest: and thus we see why the ponderous romances of the seventeenth century have ceased to delight the world, while the 'Iliad' is as fresh to us as it was to Plato or Cicero.

This additional source of interest however is that which depends in itself on the peculiarities of the age in which any one novel or class of novels appears. Thus the stilted romance of Elizabeth's time was the legitimate offspring of a taste then very prevalent for an ideal state of pastoral life called Arcadian. The readers in that day were the higher ranks, the court, and the nobility, and the novel both led and followed their taste. In another country we find romances of chivalry particularly current when the age of chivalry was nearly passed, and when the realities of Moorish warfare had been succeeded by a fashionable enthusiasm unaccompanied by action. Such were the novels which Cervantes began by caricaturing and ended by surpassing.

Sir Walter Scott's novels are in like manner the legitimate creation of their age. Percy's 'Reliques' and some other books had given a retrospective turn to literature. Men began to find that Pope and Dryden, or even Milton, did not contain all that was worth knowing in the literature of England. A race of antiquaries sprang up, and with them an antiquarian novelist. Göthe's famous saying about Shakspere, which Carlyle has so cleverly applied to Scott,—'that Shakspere formed his characters from within outwards, Scott from without inwards,' is so true, that any one who bears it in mind while reading Scott will not fail to see that the attraction of the 'Waverley novels' depends more on the dresses and decorations than on the actors.

To quote one more instance; during the first half of the last century the great object of attention was 'the town,' by which was meant the profligate life spent by men of fashion. A glance at the poetry of that age is enough to show that Nature had small charms for the reading public, and that fashion was then everything. If we turn to the novelists, to Richardson, Fielding, and Smollett, and then to their descriptions, can anything be more obvious, than that the external dress of the novel—that by which it is distinguished from other narrative works of imagination,—depends entirely on the age in which it is written, and is in effect a tolerably faithful but somewhat exaggerated reflection of the favourite ideal objects and pursuits of the reading classes at the time.

But there is another salient feature in the novel, which it possesses in common with the poetical romance, and which distinguishes it most completely from all classical fictions. We refer to the important part played in almost all novels by that kind of love which goes by the name of romantic.

It cannot be doubted that the influence of Christianity and of the old German spirit upon the nations of modern Europe has contributed to alter the treatment and condition of women, not only in degree but in kind. To the eye of a Roman observer, one of the most remarkable peculiarities of the German nation was the veneration paid to women, and this veneration, transmitted through generations, affected in no unfavourable degree by Christian precepts, although changing in appearance with the change of ages, still exists in that gallantry of which the Romans and Greeks seem to have been wholly ignorant, and which in the romantic novel, as being a picture of human life, plays a most important part. But it is still to be remembered that it is not the passion of love as a classical author would have described it, but the passion as developed in those nations among whom romantic tales have been principally current, which thus predominates in the romantic novel.

The 'Bride of Lammermoor' is perhaps the most perfect instance of a love-tale which we possess, but that touching and exquisitely pathetic story would have been in many of its most striking features unintelligible to men who did not begin by assuming, as we all instinctively do, the existence of a feeling partly corporeal, partly mental, partly dependent on national custom, which goes with us by the name of love. The only parallel instances in the remains of classical literature are, as far as the writer knows, some scattered passages in the 'Odyssey,' and the characters of Haemon and Antigone as described by Sophocles. It is important to insist on this feature of the novel, because it at once gives a clue to the popularity of those numerous love-tales which in our times appear in such profusion, are read, and disappear, provided always that we connect this feature, which runs through them all, with the desire which all of us possess of giving to those dreams of domestic happiness—which are the offspring of feelings which we inherit both by nature and by education—as much of reality as is possible.

The popularity of novels is one of the most curious features of our literature; and it is to be observed that it is attended with an almost entire discouragement of dramatic composition, and with a marked preference on the part of those who apparently patronise the drama, for scenic effect, in place of accurate dramatic delineation of character. There is scarcely one tragedy worth mention of a date posterior to the time of Fielding. 'Philip van Artevelde,' the offspring of our day, and, although far below it in merit, Talfourd's 'Ion,' are worth notice, as well for other reasons as because they have been accompanied by an effort, in act, to redeem the stage from serving as the mere vehicle of dramatised novels. But we cannot give to 'Philip van Artevelde' the name of a drama; indeed the author himself styles it a dramatic romance; and its length and the character of many of its incidents bring it rather under the romance than the drama. We have drawn a distinction between the romance and the novel, the former being the more comprehensive word; but we must still bear in mind that a prose novel stands in the same relation to a later age that a poetical romance does to an earlier, for poetry constitutes the only possible literature of an age of reciters; and it is not until men begin to read for themselves that prose comes into being.

There is another feature about the novels of the present day which deserves especial notice, and that is the manifold forms which they assume. We have them as naval tales, military records, love stories, political memoirs, the diaries of clergymen, lawyers, and physicians—suited in short to every class of readers. From this we see how much the demand influences the supply, even in that most incorporeal of all manufactures, book-making. That the appetite is fed by the supply is also true, but not to an extent sufficient to justify us in supposing that the one depends entirely upon the other. The manifold cha-

* Some ridicule has been cast on this expression, but apparently without much reason. The term is not used to express one simple notion, but as a means of indicating by a kind of verbal shorthand a number of notions which when expanded might fill volumes. Half the common theological forms in use are liable to the same objection (which is expressed by applying to them the name of 'cant'); but when all persons are to a certain extent agreed on what the words are to mean, it matters little what words we employ.

racter of modern romantic literature as compared with that uniformity which distinguished the romances of the middle ages, when author after author exhausted his powers in adding to one bulky record of the fall of Troy, or the conquests of Alexander, is the last proof which we need bring to show that romances do really depend upon and go along with the prevailing tone of the age in which they appear.

It is not the province of this work to enlarge on the probable or actual effects of any course of reading, but it may be as well to point out that the injury supposed to be done to the mind by novel reading is not peculiar to any one kind of study. A constant devotion to any abstract speculation notoriously deadens the taste; and too much cultivation of any one pursuit necessarily gives the corresponding part of the mind a growth disproportionate to that of the rest. The peculiar evil of novel-reading depends on the bad quality of the food devoured, which pampers our love for ideal griefs and joys, to the prejudice of all well organised efforts to grapple with the realities of life.*

NOVELLÆ. [JUSTINIAN'S LEGISLATION.]

NOVEMBER, the eleventh month of the Julian year, was the ninth in the year of Romulus, whence it received its name. This name was assigned to it in the Alban calendar. It originally consisted of thirty days, which were continued by Romulus and Numa. Julius Cæsar gave it another day, but Augustus reduced it again to thirty, and this number it has ever since retained.

Our Saxon ancestors called November *Blot-monath* (blood-month), the month of sacrifice, because at this season the heathen Saxons made a provision for winter, and offered in sacrifice many of the animals which were then killed. This is distinctly stated in an antient account of the Saxon months, printed in Hickes's *Thesaurus* (vol. i., p. 219). It was common at this season to slaughter oxen, sheep, hogs, &c., for the use of the ensuing winter. The stock of salted meat prepared at this time was to last through the winter months till vegetation came again sufficiently forward to enable them to resume the use of fresh provisions. Some notion of the vast extent to which the opulent provided for themselves and their retainers at this season may be formed from the contents of the larder of the elder Spenser, in 1327, which, in the month of May, contained 'the carcases of eighty salted beeves, five hundred bacons, and six hundred muttons,' the reliques of his winter provisions.

Martlemass or Martinmas beef, cured about the festival of St. Martin, the 11th of this month, was a provision formerly well and in some places still known. The Spanish proverb, 'His Martinmas is coming, when we shall be all hogs alike,' alludes to the slaughter of swine at this period.

(Pitisci, *Lexicon Antiq. Roman.*; Bosworth's *Anglo-Saxon Dict.*; Brady's *Clavis Calendaria*, 8vo., Lond., 1812, vol. i., p. 85 91.)

NOVI, The Province of, an administrative division of the Sardinian territories, which formerly belonged to the republic of Genoa, is situated on the north side of the Ligurian Apennines. The Lemmo and other mountain torrents which flow from the northern slope of the group of La Bocchetta cross the province of Novi from east to west, and flow into the Orba, which is an affluent of the Bormida. The Scrivia, a considerable stream, rises farther to the east, crosses the province of Novi in a northern direction, and then, passing by Tortona, enters the Po. The province of Novi lies chiefly among the Apennines, and is not very productive, except the most northern part, above the town of Novi, which opens into the plain of the Po, and is well cultivated, being planted with vines, mulberry, and other fruit-trees. The mountains supply pasture for cattle, and are partly covered with fine chesnut-trees. The population of of the province is 57,500, distributed among 36 communes. The principal towns are the following:—Novi, a cheerful, well-built town, is situated in a plain at the foot of the Apennines, on the high-road from Genoa to Turin and Milan: the continual transit of goods and travellers gives it an appearance of bustle. Novi has several churches, a college kept by the Fathers Somaschi, and some handsome palaces belonging to the Genoese patricians, who come here to spend part of the autumn: the population is about 10,000. The Genoese style of painting the fronts of the houses with various colours is in use at Novi. Voltaggio, at the foot of La Bocchetta, on the old road to Genoa, is a poor-looking place. It has a grammar-school and 2200 inhabitants. Serravalle, on the new and fine road by the banks of the Scrivia, had 2100 inhabitants in 1824; but the population has since increased, owing to the trade which now follows this line. Gavi is a small town with a strong castle, which commands the defile in the mountains through which the old road passed. Pozzuolo has 3000 inhabitants. Arquata has 2400 inhabitants. All these towns have communal or elementary schools.

It was in the neighbourhood of Novi that the French army, 40,000 strong, under Generals Joubert, Moreau, and St. Cyr, was attacked by the Austro-Russians under Suwarrow and Melas, on the 15th August, 1799, and completely defeated, after ten hours' continual fighting. It was one of the most obstinate and murderous battles of the wars of the French revolution. General Joubert was killed, and Generals Perignon and Grouchy were wounded and made prisoners. The French lost 10,000 men, killed, wounded, and prisoners. The Austro-Russians had about 12,000 men killed and wounded. Moreau withdrew the remains of the French army across the Apennines towards Genoa.

(Botta, *Storia d' Italia*, b. xvii.)

NOVICE, the appellation given to persons of either sex, who are living in a monastery in a state of probation previous to becoming professed members of a monastic order. Persons who apply to enter the noviciate state, on being admitted by the superior of the monastery, promise obedience to him during the time of their stay, and are bound to conform to the discipline of the house, but they make no permanent vows, and may leave, if they find that the monastic life does not suit them. The period of the noviciate must not be less than one year, and the person who enters as a novice must have attained the age of puberty. Richard, in the 'Bibliothèque Sacrée,' article 'Novice,' describes the qualities required according to the canons of the council of Trent for the admission of a novice: they are health, morality, voluntary disposition for a monastic life, intellectual capacity, &c. No married person can be admitted unless by the consent of both parties; no person who is encumbered with debts, or whose assistance is necessary for the support of his parents, is admissible. Widowers and widows may be admitted as novices, unless their labour is required for the support of their children. After the termination of the year of probation, the novice, if he (or she) persists in his vocation, and his conduct and capacity have proved satisfactory, may be admitted into the order by taking the solemn vows which are binding for life. Ducange, in his 'Glossarium,' article 'Novitius,' quotes the 34th canon of the council of Aquisgrana, A.D. 817, in which superiors of monasteries are cautioned against admitting novices with too great facility, and without a full examination of their disposition, morals, and mental and bodily qualifications. But in after-ages, as the number of monasteries was multiplied beyond measure, prudential restrictions were disregarded, and every means were resorted to in order to induce young people to enter the monastic profession, and parents often forced their children into it against their will. The misery and guilt which resulted from this practice are well known, but few perhaps have exhibited them in so vivid and fearful a light as a living Italian writer, Manzoni, in his 'Promessi Sposi,' in the episode of 'Gertrude.' It was in order to guard against such abuses and their fatal results, that the council of Trent, session 25, cap. 17, prescribed that female novices, after the expiration of their noviciate, should leave the walls of the monastery and return to their friends, and be carefully examined by the bishop of the diocese, or by his vicar by him delegated, in order to ascertain that they were under no constraint or deception, that they were fully aware of the duties and privations of the monastic life, and that they voluntarily chose to enter it. These humane precautions however have been evaded in many instances; and it may be doubted whether a very young person should be allowed to bind himself for life by irrevocable vows.

NOVIKOV, NIKOLAI IVANOVITCH, born April 27th, 1744, at Tikhvensk, near Moscow, was, if not particularly eminent as a writer, one to whom Russian literature is greatly indebted, on account of what he did for the book-trade, and for printing, and for diffusing a taste for reading among his countrymen. Though his parents were wealthy, he did not receive the very best education, being brought up at home until the age of eighteen, when he entered the government service, and then first began to apply himself

* For the distinction between a hearing and a reading age we are indebted to Mr. C. J. Vaughan's prize essay recited in Trinity College Chapel, Cambridge, December, 1837.

to study. Having thus conceived a passion for literary pursuits, he determined upon devoting himself to them exclusively, and accordingly he retired from the service. One of his first productions was his 'Zhivopisetz' (the Painter), a work somewhat on the plan of the 'Spectator,' and displaying considerable talent and satiric power in sketches of manners and characters; and which, although now become somewhat obsolete, still retains its popularity, and has been frequently reprinted; yet the later editions are not very correct. He shortly afterwards published his 'Opuit' (Specimen or Essay of a Lexicon of Russian Authors), which has preserved notices of many writers respecting whom little would otherwise now be known. These works procured him the notice of the empress Catherine, and he soon after settled at Moscow, where a wide field opened itself to him. With the consent of the government, he established in that capital a Typographical Society, having for its object the printing of useful books at a cheap rate, and diffusing them through the empire. He also set up the first circulating library; and did very much both to improve the character and increase the sale of journals and other periodicals. Neither was his attention confined to such improvements, for he helped to introduce many into the system of school-education. His activity and that of his associates was however looked upon with suspicion by many, and they were represented as favouring the principles of, if not themselves actually in league with, the philosophers and revolutionists of France. The consequence was that the society was broken up, and Novikov received a command to retire to a distant province. After the emperor Paul's accession he was permitted to return, but he from that time lived almost in retirement from the world, and devoted to mystic speculations, upon his estate at Tikhvensk, where he died, July 31 (Aug. 11), 1818.

Novikov has been compared to Franklin, and he was certainly a very active and useful person. He is said to have possessed in a very extraordinary degree the art not only of gaining over others to his schemes, but of rendering them as eager and zealous in them as himself. Hence, notwithstanding the vast sums which his speculations required, they never were hindered by want of funds, for rich merchants and wealthy proprietors were always pressingly ready to advance whatever might be necessary. He himself was equally disinterested, his object being not to enrich himself, but that his schemes should succeed for the benefit of the public; at all events, it is certain that he died poor.

Among his own publications, in addition to those already mentioned, was a collection of historical documents and materials, entitled the 'Old Russian Library,' 1773-5, in ten volumes, and afterwards continued to twenty more.

NOVOGOROD, one of the eight governments of Great Russia, derives its name from its capital, which was formerly the residence of the most powerful of the Russian grand-dukes, whose dominions included also the present governments of Olonez, Pskow, Twer, and part of that of St. Petersburg. The government in its present limits extends from 57° 18′ to 61° 8′ N. lat., and from 30° 10′ to 39° 40′ E. long. It is bounded on the north-west by the government of Petersburg, on the north by that of Olonez, on the east by Wologda, on the south-west by Jaroslaw and Twer, and on the south-west by Pskow. The area, according to Schubert, is 54,100 square miles, or about 4000 square miles less than that of England and Wales. It is divided into ten circles, and the population in 1838 was 950,000.

Face of the Country; Soil; Climate.—Part of this government is traversed by the Waldai hills, which run through this government and Twer, and are probably in no part more than 300 feet high. The face of the country is diversified with hills, rivers, high banks, plains, valleys, marshes, and lakes. The northern part is low and swampy, and for the most part covered only with peat. In the southern part the soil is clayey or sandy, and in some places there is a black mould. There are fine pastures, and the agricultural produce amply repays the labour of the husbandman.

The Waldai chain, so called from the town of Waldai, extends on the south-east part of the government to the frontier of Twer, forming a line of detached hills about 100 miles long, which are close to each other, and almost all of them cultivated. In the narrow intervening valleys there is a pleasing mixture of wood and water scenery. The principal rivers are the Msta, which comes from Twer, and the Wolchow. The Msta has some falls at Borowitschi, but is navigable below them, and runs into Lake Ilmen. The Wolchow, which issues from Lake Ilmen, and flows into the Ladoga canal, is from 600 to 1200 feet in width, and has sufficient depth of water for barks during the whole summer. These two rivers, which are connected by Lake Ilmen, complete the great water-communication between the Wolga and the Neva. The other chief rivers are, the Lovat, the Pola, and the Schelon, all of which fall into the Ilmen; the Schekona and the Wologa, which join the Wolga; and the Sias and the Buscha, which run into Lake Ladoga. The government contains 42 rivers, and 3 large and 55 smaller lakes. The Belosero, which is the largest, is above 26 miles in length and as many in breadth, and is connected by the Schekona with the Wolga. Lake Ilmen, which is 26 miles long and 16 wide, receives many large and small rivers, and is connected by the Wolchow with the Ladoga canal. Lake Wosch is 14 miles long and 8 wide. The Novogorod canal, which was completed in 1802, is a part of the great system of communication between the Neva and the Wolga. It is about 5 miles long, connects the Msta directly with the Wolga, and so avoids Lake Ilmen, the navigation of which is often dangerous on account of the frequent storms.

The climate is cold, and very much like that of the government of Petersburg, though the latter seems to be really rather milder than that of Novogorod, where the winter, in the northern circles at least, is colder, and begins a fortnight sooner and lasts a fortnight longer than in the southern circles. This low temperature has an injurious effect on the growth of many vegetables, and on the domestic animals, for whose subsistence it is difficult to provide during the long winter; but it does not affect the health of the inhabitants.

Natural Productions.—Agriculture is the chief occupation of the inhabitants, though the climate in the northern circles is unfavourable, and the frequent and early night frosts often destroy all prospect of a good harvest. The inhabitants too are rather slovenly in their operations, and have no regular system of cultivation. They however produce more than they require for their own consumption. The chief agricultural products are rye, barley, oats, some buckwheat, and great quantities of peas. Flax and hemp are cultivated, not only for home consumption, but for exportation. Turnips, cabbages, potatoes, onions, radishes, and leeks are cultivated, as well as cucumbers and pumpkins; and in the southern circles, apples and cherries are now and then grown. The country is covered with thick forests, but there are scarcely any oaks; the maple, the ash, and the willow are rare; the most common trees are pines, firs, birches, alders, elms, and much underwood. Timber is a great staple article of the government, but by no means turned to so good account as it might be; and many of the forests are inaccessible in summer on account of the swamps. The crown forests alone cover a fifth part of the whole surface. All the forests abound in berries of various kinds; they likewise contain game and beasts of prey, such as deer, elks, bears, wolves, lynxes, badgers, martens, hares, and squirrels. Owing to the length of the winter, the breeding of cattle is limited to what is necessary for the purposes of agriculture. The horses, oxen, and sheep are of the common Russian breeds; few swine and goats are kept. The fisheries on the lakes and rivers are extremely productive, and furnish an abundant supply both for home consumption and for exportation to Petersburg, Moscow, Twer, Pskow, and Jaroslaw: several of the small rivers produce pearls. The mineral products are iron, freestone, coals, slate, salt, clay, lime, and marl. The principal salt-springs are at Staraja-Russia, where from one to four millions of pounds of salt are annually made, which supply the provinces of Novogorod and Twer.

Manufactures and Trade.—There are no manufactories of any importance. In the towns there are some domestic manufactures, and in the country the people make coarse linen, soap, tallow candles, and great quantities of potash. They have likewise small furnaces in which they smelt the bog-iron found in the government, and manufacture it into small articles of iron-ware. There are some trifling distilleries. The export trade of the province is confined to its own productions, corn, hemp, flax, salt, some iron, a great quantity of timber, some furs, hides, leather, and forage, most of which goes to Petersburg. The principal place of trade is Novogorod, the capital, the commerce of which however is not very great. Most of the goods are exported by the inhabitants themselves, who visit the commercial towns

and fairs to the distance of 60 or 70 miles, in caravans of 50 or 100 carts, or in sledges drawn by one horse. Great numbers of geese are sent from this government to Petersburg.

The great majority of the inhabitants are Russians, with a few families of Finns, and in the towns some Germans. The predominant religion is the Greek, under the archbishop of Novogorod, one of the highest prelates in the empire, whose diocese includes also the government of Olonez. He generally resides in Petersburg, where he is metropolitan. Among the Finns there are many Lutherans and some Lutheran churches.

NOVOGOROD (or *Novgorod*, or *Novgorod Welike*, that is, the Great New City), the capital of the above government, is situated in 58° 32′ N. lat. and in 31° 20′ E. long., 120 miles south-south-east of St. Petersburg, in a fine country on the banks of the Wolchow, where it flows out of Lake Ilmen, and on the Novogorod Canal. The city consists of three parts: the fortress, standing on a steep hill on the north side of the river, surrounded with thick walls and towers; and on the south of the river the commercial town and the Sophienstadt (St. Sophia's Town), which are connected with the fortress by a handsome stone bridge. This city is one of the most antient in the Russian empire, having been founded, according to Nestor, the historian, in the fifth century, about the same time as Kiew. In the ninth century it had its own prince, and Ruric made it the seat of government, but the court was soon afterwards removed to Kiew. Jaroslaw, his successor, gave the city considerable immunities in 1036. The governors however made themselves independent of the Russian grand-dukes. The citizens, having gradually acquired more extensive privileges, established a republic in the twelfth century, under a chief magistrate, whose office was hereditary, but whose power was limited. This new republic became very flourishing, and its territory is said to have extended to Livonia on the west and to Siberia on the east. In the thirteenth century the Hanseatic League established a factory here, which continued 200 years. Being most advantageously situated for trade, the town became extremely flourishing, and is said to have had in the fifteenth century 400,000 inhabitants, which gave rise to the saying, 'Who can resist God and the Great Novogorod?' The grand-dukes of Russia becoming jealous of its prosperity, Ivan Wassiliewitsch I. completely reduced it under his power in 1477. It was governed with great severity, and a conspiracy against him having been formed in 1570, Ivan Wassiliewitsch II. went thither in person, and caused many of the richest inhabitants to be executed. The government continued to treat the city with great rigour till the final blow was given to its prosperity by the foundation of St. Petersburg, which diverted the commerce of the Baltic into a new channel. Novogorod is now reduced to comparative insignificance. It consists principally of scattered groups of mean houses, separated by ruins or by fields formerly built upon, and its population does not exceed 10,000. Yet, when viewed from a distance, it has a very striking appearance, owing to its fine situation and the gilded domes of its sixty-three churches, which remain as monuments of its antient splendour. The principal church is the cathedral, dedicated to St. Sophia, which stands in the fortress, and contains, among many other curiosities, the coffin of St. Ivan of Novogorod, to which numerous pilgrims resort, and the celebrated bronze doors, 11½ feet high and 3 feet wide, adorned with numerous figures and inscriptions, which are said to have been brought, in 988, by Wladimir the Great from Kherson, but which probably came from Germany. The other buildings are, three monasteries, of which that of St. Sergius is the principal, a fine bazaar, a new palace, a poor-house, and an orphan-school. There are several elementary schools and a Bible Society, a considerable sail-cloth manufactory, tanneries, and soap and candle manufactories.

Other towns in the government of Novogorod are—Staraja-Russa, on the Polista, with 5600 inhabitants, and considerable salt-works; Waldai, on the Waldai lake, with 3200 inhabitants; Tichwin, on the Tichwinka, with 4100 inhabitants; Kirdow, with 2300 inhabitants, remarkable for the new canal opened in 1827, which joins the Scheksna with the Suchona; Belosersk, on the Scheksna; Somina, on the river of the same name, with 5000 inhabitants: before the end of the fair at Nischnei-Novogorod this is a place of great animation, fifteen or twenty thousand persons being often assembled here; and Ustjushna, or Schelesopolskaja, in a country abounding in iron; the inhabitants, 2500 in number, have considerable trade in iron and timber. All the above towns are capitals of circles of the same name (Schubert; Hassel; Cannabich; Krusenstern.)

NOWANUGGER. [Hindustan, p. 213.]

NOYON. [Oise.]

NUBIA, a general and rather vague denomination which is often used to designate a vast extent of country stretching along the banks of the Nile from the southern borders of Egypt to the frontiers of Abyssinia and Sennaar. The natives however apply the name of Nouba, or Wady el Nouba, to a comparatively small tract lying between Derr and the borders of Dongola; whilst in Egypt, the natives of the countries above the cataract of Assouan, as far as Dongola, are called by the general name of Berabera, and the name of Nouba is given to the black slaves brought from Sennaar and the countries south of it. (Burckhardt.) The antient general name for the regions south of Egypt was Ethiopia above Egypt, of which the kingdom of Meroe formed an important part, and among the various people therein mentioned by the antient geographers are the Nubæ, or Nubæi Ethiopes, who are placed south of the island of Meroe, whilst the Blemmyes were nearer to the borders of Egypt, west of the Nile, and the Troglodytes lived to the eastward, near the shores of the Red Sea. The extent of information possessed by the antients concerning those regions, and especially concerning the kingdom of Meroe, is stated under Ethiopia.

The Nubæ, or Nubatæ, are mentioned as a nation bordering on Egypt in the time of Diocletian, who gave up to them a strip of land seven days' march in length, above the first cataract, on condition of their preventing the Ethiopians and Blemmyes from attacking Egypt. In subsequent centuries however a kingdom of the Noubas was formed, which is mentioned by the Arabian geographers as a powerful Christian country at the time of the invasion of Egypt by the Moslems. Dongola was the residence of the king of the Noubas. The country appears to have continued to profess Christianity, and to have retained its independence till the thirteenth century of our æra. Makrizi, an Arabian writer of the fourteenth century, quoting from his predecessor Ibn Selim el Assouany, who had visited the country, gives a good description of the kingdom of Nubia. He says that 'the Noubas and the Mokras were two different races, speaking two different languages, and both living on the Nile. The Noubas are the Merys, who border on the Moslemin country, and speak the Merysy language; that the ancestors of both the Noubas and Mokras were natives of Yemen, and that before the Christian creed, the two nations were Sabæans, adoring the stars, to which they had erected idols, and that they were often at war with each other, but afterwards they all became Christians, and the city of Dongola was the seat of their government.' (Extracts from Makrizi, in Appendix to Burckhardt's *Nubia*.) It is remarked by Burckhardt, that even now two different languages, both distinct from the Arabic, are spoken in Lower Nubia, namely, the Nouba and the Kenous, and that the name of Mokra still remains in the appellation of Wady Mokrat, which is three days' journey below Berber.

Soon after the invasion of Egypt by the generals of the caliph Omar, a Saracen army advanced to Dongola, and obliged Koleydozo, the king of the Noubas, to agree to pay an annual bakt, or tribute, of 360 head of slaves. This agreement was maintained with little interruption for more than five centuries, when, the Noubas having attacked and destroyed Assouan, Salah-ed-deen, the famous sultan of Egypt, sent an army against them and defeated them. In the following century Dhaher Baybar, the Mameluke sultan of Egypt, sent an army into the Nouba country, which took Dongola, ruined most of the churches, taking away the golden crosses and silver vessels, and carried away a vast number of captives. Daoud, or David, the king of the Noubas, who had provoked the war, fled, and his nephew Shekendy was made king in his stead by the Egyptian force. Shekendy agreed to pay an annual tribute of three elephants, three giraffes, one hundred camels, four hundred choice cows, and four hundred slaves. Besides this, the territory of the cataracts (probably that between the first and second cataracts), about one-fourth part of Nouba, was to belong to the sultan, and the people were to pay a capitation tax as long as they remained Christians. This convention however was not long respected, for Shekendy being driven away from the throne by a usurper named Samamoun, Sultan Seyfeddyn, Baybar's successor, sent a

large force into the Nouba country, which defeated Samamoun near Dongola, and overran the country beyond that town for fifteen days' journey. The kingdom of Nouba was then given to a cousin of Samamoun, and the army returned to Egypt, carrying with them great numbers of Nouba captives, men and women, whom they sold at Cairo. Soon after the departure of the army, Samamoun recovered his kingdom, and the rival king took refuge in Egypt. The sultan of Egypt then sent an army of 40,000 men to recover the Nouba country, accompanied by 500 vessels of all sorts to ascend the Nile. The soldiers plundered and destroyed everything on their way until they reached Dongola, which they found deserted by the inhabitants. Samamoun escaped up the river, and being pursued by the Egyptians fifteen days' journey above Dongola, he fled to Aboab, in the territory of the king of Aloa, another Christian state, said to be more powerful than that of Nouba. His officers, bishops, and priests abandoned him, and obtained a safe conduct from the commander of the Moslems. The army then returned to Dongola, where a great feast was made and a banquet spread in the church of Ysous (Jesus), the principal church in Dongola. A nephew of old King Daoud was then crowned, and a body of troops left for his defence. The payment of the bakt, or tribute, was resumed, and after an absence of six months the army returned to Assouan, with great booty. No sooner had they left Nouba, than Samamoun returned in disguise to Dongola, and knocked at the door of all his officers, who, when they came out and saw him, kissed the ground in sign of allegiance. On the next morning he assembled the army and proceeded to the mansion of the new king, sent the Moslem guard back to Egypt, and seizing his rival, dressed him in an ox-skin and tied him to a post, where he was left till he died. Samamoun then wrote to the sultan of Egypt, asking his pardon, and promising to forward the bakt regularly, and in the meantime sent slaves and other presents, which were accepted. (Extract from Makrizi's 'History of the Sultans of Egypt,' in the Appendix of Burkhardt's *Nubia.*)

These events happened in the early part of the fourteenth century. After that time little is known of the history of Nubia, but it seems that the power of the kings of Dongola being broken, the country became divided into various petty states, while fresh immigrations of Bedouin Arabs took place, and Christianity became gradually extinct in all the countries between Egypt and Abyssinia. The remains of numerous Christian chapels are still seen along the banks of the Nile. The Mamelukes, and after them the Ottomans, retained possession of Lower Nubia as far as the second cataract, keeping garrisons at Ibrim, the island of Say, and Suakim. The old kingdom of Nubia ceased to exist, and instead of it rose various petty Mohammedan states, such as Sukkot, Mahass, Dongola, Berber, and others, each governed by a Melek, or chief. The name of Nouba however has remained to the tract of country north of Dongola as far as Seboua, from which place the remaining tract down to Assouan is occupied by the tribe of Kenous. Both the Noubas and Kenous derive their origin from Arabian Bedouins, who immigrated at various times and mixed with the aboriginal Christian inhabitants, who embraced their faith; while the conquerors adopted the language of the country, and to this day the Kenous and Nubian languages are spoken in all Lower Nubia, to the exclusion of Arabic, which appears again as the oral language in Dongola, from whence it continues all the way up to Sennaar. Burckhardt gives short vocabularies of the Nouba and Kensi or Kenous languages, between which there appears to be some etymological affinity.

The Noubas and Kenous are black or nearly so, but have not the negro features nor woolly hair. Many of them have the peculiar style of countenance which is often seen in the sculptures of the Egyptian temples.

The appearance of part of the country of Lower Nubia is described under BATN EL HAJAR. The districts of Sukkot and Dar el Mahass, which lie farther south, are more favoured by nature. The inhabitants of Mahass speak the Nouba language, but appear to be a distinct race from the Noubas; their countenances are much less expressive of good nature; in colour they are quite black; their lips are like those of the negro, but not the nose or cheek bones; they pretend to be descendants of the Koreysh Arabs.

The conquests of Mehemet Ali, pasha of Egypt, have of late years opened to the researches of travellers the countries of the Upper Nile, which had for ages been inaccessible to Europeans. In October, 1820, a force of about 4000 men, with ten field-pieces, assembled at Wady Halfa on the second cataract, under the command of Ismael Pasha, son of Mehemet Ali. They were accompanied by boats of various sizes for the purpose of ascending the river. They proceeded to Dongola without opposition. [DONGOLA.] The remnants of the Mamelukes, who had retired there some years before, fled to Shendy. But the country lying next above Dongola, along the great bend of the Nile, was occupied by the Sheygeia, a daring independent tribe of Arabs, possessed of an excellent breed of horses, and who lived a predatory life, and had become the terror of all the countries between the second cataract and Sennaar. They always fought on horseback, with lance, broad-sword, and shield. They had built strong castles on the hills, where they secured themselves and their booty, and obliged the native peasantry to work the fields for them, to raise food and forage to fill their stores. In short the Sheygeia exercised in the regions of the Upper Nile the same power as the Mamelukes formerly did in Egypt. The country of the Sheygeia is populous and one of the best cultivated in Upper Nubia, being irrigated by means of numerous water-wheels. The Sheygeia speak Arabic exclusively, and many of them read and write it. They have schools, and their learned men enjoy great consideration. Like other genuine Arab tribes, they strictly respect the duties of hospitality. These were the first enemies whom Ismael Pasha was to encounter on his march. They had already fought against the Mamelukes of Dongola with success. Hearing of Ismael's advance, they sent messengers to ask 'why he menaced them with war.' The pasha replied: 'Because you are robbers who live by disturbing and pillaging all the countries around your own;' to which they retorted, 'that they had no other means of living.' 'Why don't you cultivate your land,' said then Ismael, 'and live honestly?' They answered, with great frankness: 'We have been bred up to live and prosper by what you call robbery; we will not work, nor change our manner of living.' 'I will make you change it,' said the pasha. (*Narrative of an Expedition to Dongola and Sennaar*, by an American.)

In the first encounter the Sheygeia charged the advanced-guard of the pasha with great courage, but they could not withstand the regular fire of the carabines of the Osmanlees, and they dispersed themselves. They soon however made another stand in greater numbers, but the pasha having ordered up his guns, they were again defeated with great slaughter, and most of them fled across the desert to Shendy, leaving the country formerly subject to them in the hands of the conqueror. Contrary to former Turkish practice, Ismael protected their women and children from ill usage. Their chiefs afterwards demanded and obtained pardon, and some of them followed the pasha to Sennaar, and proved most useful auxiliaries. The conquests of the Sheygeia country disclosed for the first time to the eyes of strangers the temples and pyramids of Mount Barkal and Napata, the finest monuments of Upper Nubia. [BARKAL.] From thence Ismael proceeded to Berber, which country made its submission, and there the army rested for two months. A description of the country of Berber, one of the finest on the Upper Nile, is given under BARABRA. At Berber the pasha received the submission of some of the Mameluke beys, who had fled to Shendy, and he gave them assurance of living in peace in Egypt for the rest of their lives. He also received the forced submission of Nimir, malek of Shendy, who came in person to kiss the hand of the conqueror. The army continued its march southwards, and after eight days' march from Berber, following the west bank of the Nile, arrived at Shendy on the 9th of May, 1821.

Shendy is the principal place in the country of Atbara, the antient island of Meroe, so called because it is in a manner enclosed between the Nile on the west, the Atbara or Tacasse on the north and east, and the Dandar, Rahat, and other streams coming from the mountains of Abyssinia on the south. The interior of this vast country is little known; it is nominally divided between the states of Shendy and Halfay, which is to the south of the former, the two maleks or chiefs of which are said to be able to bring into the field thirty thousand well mounted horsemen. 'Our route from Berber,' says the American writer already quoted, who accompanied Ismael, 'led through a country consisting of immense plains of fertile soil, extending many miles from the

river, and mostly covered with herbage; few mountains or hills were visible. We passed many large villages built at a distance from the river to be out of the reach of the inundation. The houses were generally built with sloping roofs of thatched straw, as the country is here subject to periodical rains.' Cailliaud, who accompanied the same expedition, observes that the periodical rains extend to the northward to between 17° and 17° 30′ N. lat.; and it is remarkable that Strabo says that Meroe, the present Shendy, which is about 17° N. lat., was the limits of the rains. The rains extend to Berber, where they last three months, beginning about March. North of that, between Berber and Assouan, there is no fixed rainy season, but heavy showers fall now and then in all seasons. The bed of the Nile in Shendy is frequently about a mile and a half broad, though the actual stream is much narrower and shallow in the dry season. The country produces dourra, some wheat, vegetables, chick peas, and other pulse. The cattle are remarkably fine. The strip of cultivable soil near Shendy is very narrow, but to the north and south of the town there are some fine arable plains. Water-wheels are common on those high banks which the inundations do not attain, but the Arab peasantry are too lazy to bestow the labour necessary to water the soil a second and third time, as is done in the elevated parts of Upper Egypt. Elephants are first seen at Abou Heraze, in the southern parts of Meroe, on the borders of Sennaar, and they have never been known to pass to the north of that district, which is bounded by a mountain-range six or eight hours in breadth, reaching close to the Nile. Burckhardt was told that tigers were frequently seen in the wadys east of Shendy, towards the banks of the Atbara, or Tacazze. In the mountains of Dender, a district towards the Atbara, six or eight days' journey south-east of the Shendy, the giraffe (zerafa, *i.e.* 'the elegant,' in Arabic) is found. Crocodiles are very numerous in the Nile about Shendy, and much dreaded; but the hippopotamus is rarely seen. (Burckhardt.)

The town of Shendy, the capital of the country, about half a mile from the east bank of the river, is large, and perhaps contains five or six thousand inhabitants; the streets are wide and airy; the houses are low, but well built of clay; there are regular market-places, where, besides meat, fowls, liquid butter, grain, and vegetables, spices from Jidda, gum Arabic, beads and other ornaments for the women are sold. Great numbers of slaves from Abyssinia, Sennaar, and Darfur are purchased at a moderate price; a handsome Abyssinian girl sells for 40 or 50 dollars.

There is another town on the opposite or western bank of the Nile, called Shendy el Gharb (Shendy on the west), which is also large and well built, and contains about six thousand inhabitants. It has three market-places, where the people of the country exchange dourra and dollars for other provisions and goods. The people of Shendy have a bad character; they are said to be fraudulent, debauched, and treacherous.

Many Arab tribes inhabit the territory of Shendy, the great part of whom still lead the Bedouin life. The merchants of the town, and especially the brokers, are mostly foreign settlers from Dongola, Sennaar, Darfur, and Kordofan. A succession of Arab meleks, or kings, of whom Cailliaud gives the series, had ruled Shendy for nearly two centuries and a half. The habits of the people are nearly the same as at Berber, but there is more wealth, in consequence of the great trade, and more well-dressed persons are seen than in the latter country.

Not far from eastern Shendy, to the northwards near a village called Assour, or Hatchour, are a number of tarabyls, or pyramids, the largest of which is about sixty feet high. Small sanctuaries with sculptures are attached to them, as to those near Mount Barkal. There are also extensive fragments of walls, columns, square pillars, and the remains of a small temple sixty feet in length, near the borders of the desert, and those of a larger one, with its propylæum. At another place called Naga, a little above Shendy, on the river side, are the remains of a Typhonium and other ruins; and farther south, at some distance from the Nile, are the remains of other temples, and of an avenue of sphinxes, and several sculptures executed in a rude and heavy style.

About twelve miles nearly due north of Naga, in a valley bordering on the desert, are the ruins of El Mecaourat, which consist of several temples of small dimensions, connected by galleries and terraces, with a number of small chambers, the whole surrounded by a double enclosure. It has been supposed that this retired spot may have been the Hieropolis, or sacred college, of the priests of Meroe, and that the city itself was near Assour. (Cailliaud, *Voyage à Meroe.*)

Halfay, which lies south of Shendy, and between it and Sennaar, is a less important state. Its melek submitted to Ismael Pasha like the others. The head town, of the same name, lies above the confluence of the White and Blue rivers, and on the east bank of the latter, in about 15° 40′ N. lat. Halfay was formerly subject to the king of Sennaar, from which it is separated by the Blue River, which is the utmost limits that can be assigned to the geographical denomination of 'Nubia.' The country beyond it is described under SENNAAR.

The monuments of Lower Nubia have been described by Gau, Burckhardt, Belzoni, and others. The most remarkable are the temples of Abousambul [ABOUSAMBUL], Dandour, and Soleb; though the last, lying above the second cataract, is considered by some writers as in Upper Nubia. A short account of these temples is given in the *British Museum*, 'Egyptian Antiquities,' published by the Society for the Diffusion of Useful Knowledge, vol. i., chaps. 7 and 8. The monuments of Upper Nubia and of Meroe have been described by Waddington, Cailliaud, and Rüppel.

The whole country, up to Sennaar and Kordofan, is now open to the investigation of European travellers, being under obedience to the Pasha of Egypt. It may be not amiss to state that the young and enterprising Ismael, who achieved the subjugation of these vast and almost unknown regions, and who carried his arms beyond Sennaar as far as 10° N. lat., met with a tragical death from treachery on his return towards Egypt in the summer of 1823. Passing through Shendy, he had the imprudence to retire with a few attendants to some distance from his camp, to enjoy, it is said, a nocturnal banquet. Malek Nimir, who was watching for an opportunity of revenge, set fire to the hut where the pasha feasted or reposed, and to the shrubs and dourra which surrounded it, and the young conqueror perished in the flames. His mutilated remains were found by the soldiers, and brought back to Cairo. His attendants were massacred by the natives, and the Greek physician to the army was first tortured by having all his teeth extracted. This man had rendered himself odious by several acts of cruelty, which Cailliaud mentions. Ismael was hardly four-and-twenty years old at the time of his death. Melek Nimir, with his accomplices, fled into Darfur.

NUCI'FRAGA. [NUTCRACKER.]

NUCLEOBRANCHIA'TA, M. de Blainville's name for his fifth order of his second section of his second subclass (*Paracephalophora Monoica*).

M. Rang, who has illustrated the anatomy of some of the families, makes the *Nucleobranchiata*, in his arrangement, the first order of Cuvier's class *Gasteropoda*, and comprises under it some of the *Heteropoda* of Lamarck and the family *Pterotrachées* of De Férussac.

The following character of the order is given by M. Rang:—

Animal furnished with a foot compressed into the form of a fin, with an acetabulum or sucker (ventouse) on its superior border. Branchiæ pectinated. Both sexes comprised in the same individual.*

Often a *shell*, which is spiral, has a very large aperture, and is vitreous and very fragile.

An *operculum* sometimes.

M. Rang observes that the Mollusks which he had already, in an anatomical memoir on the genus Atlanta, proposed to assemble under the name of *Nucleobranchiata*, borrowed from M. de Blainville, are all pelagic animals which are often met with on the surface of the sea in calm weather, swimming in an inverted position by the aid of their foot, which is compressed into a fin. They never creep, but they have the power of fixing themselves (to floating bodies only) by spreading upon them the sucker of their ventral fin, and at the same moment making a vacuum. The shells are very much sought after in collections on account of their extreme rarity.

Two families, according to M. Rang's arrangement, constitute the order *Nucleobranchiata*.

* N.B. M. Verany, in his description of *Carinaria*, says, 'Sexes séparés comme dans les Firoles; les males ont leur organe sex el placé antérieurement dans le côté gauche sous la nageoire dorsale, les femelles l'ont près de l'anus.'

1.

Firolidæ (*Pterotrachées*, Fér.; *Nectopoda*, Blainv.; *Uro-branchia*, Latr.).

Animal elongated, straight, and horizontal; one or more fins; branchiæ forming, with the other viscera, a nucleus on the dorsal part.

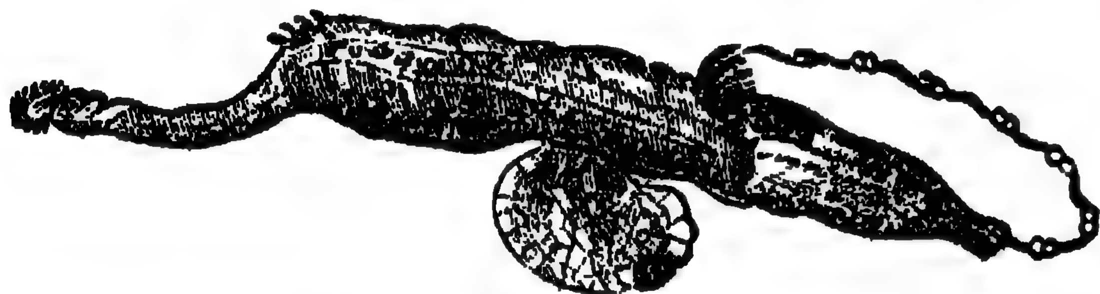
Shell sometimes present, and, when it is, incapable of containing more than a very small part of the animal.

Genera. Firola (*Pterotrachea*, Forsk.; *Firoloides* and *Sagitella*, Les.).

Generic Character.—Animal very much elongated, gelatinous and transparent, terminated behind by a tail more or less long and pointed; mouth situated at the extremity of a proboscis, and including an apparatus proper for mastication.? No tentacles, or only two tentacular rudiments carrying the eyes at their external base; one or more fins; nucleus exposed, protected only by a membrane, and always situated below and behind the ventral fin; termination of the intestinal canal and of the organs of generation in a tubercle on the right side.

No shell. (Rang.)

The author whose characters we have above given remarks that the *Firolæ* are very common animals in the seas of the warm and temperate zones, and are remarkable for their extreme transparency, which is often interrupted by golden spots. Lesueur, to whom we owe information regarding their anatomy, mentions several species, perhaps too indistinctly defined. He also divided the *Firolæ* into three genera, viz. the true *Firolæ*, the *Firoloïdes*, and the *Sagitellæ*; but the generic distinctions upon which they rest appearing to M. Rang to be insufficient even for the establishment of subgenera, the last-named zoologist does not adopt them, and he thinks that perhaps the genus *Hyptera* of M. Rafinesque ought to be included in the genus comprehending the *Firolæ*, observing however, at the same time, that details on this subject are wanting. The species indeed, he adds, are sometimes very difficult to be determined, in consequence of the mutilations to which they are subject; and it is for this reason that great circumspection should be employed in establishing new species.



Firola Frederici.

Carinaria. (See the article.)

M. Rang remarks that the mollusks which form this genus are beautiful animals, transparent as crystal, and adorned with vivid colours. They are only found on the surface of the sea in calm weather, and are most frequently mutilated in some part or other, especially in the nucleus, which makes their shells comparatively rare in collections. M. Rang states that there are four well characterised species, *Carinaria vitrea* (the most rare, and the animal belonging to which has not yet been made known), *C. fragilis*, *C. Mediterranea*, and *C. depressa*; this last, which is comparatively new, was discovered by M. Rang in the seas of Madagascar.

M. Rang's experience is, that he can offer as a constant character the presence of asperities on the mantle of these mollusks, because he has observed them upon four very distinct species (*Carinariæ Mediterranea* and *depressa*, and two other species which he has not been able to make known on account of their mutilation), whilst he never met with such asperities in the *Firolæ*, in which, instead of asperities, there are numerous spots. The difficulty, he remarks, of distinguishing mutilated *Firolæ* and *Carinariæ* at sea, obliges the observer to neglect no character which may lead to a more easy determination, and that is the reason why he calls attention to the position of the branchial comb as a probable character, which has always appeared to him to be placed before the nucleus in the *Carinariæ*, and behind it in the *Firolæ*. The position of the nucleus with reference to the ventral fin may also, in his opinion, afford a good generic character.

*** In the cut taken from M. Verany's figure of *Carinaria*, vol. vi., p. 2[illegible]4, the letter *e*, indicating the line which points out the tentaculum, has dropped out.

Atlanta. (Lesueur.)

The reader will find a short account of this form under the article headed by its name; but the description of M. Rang, who has published an anatomical memoir on this curious genus, will be a valuable addition.

Animal.—Body compressed laterally, spiral, with a large foliaceous fin, furnished with a sucker at its posterior border; head in the form of a long proboscis; two cylindrical tentacles in front of two large eyes, which are pediculated, as it were, at their base; mouth at the extremity of the proboscis; male organs of generation at the right side, implanted at the base of a very large tube, which terminates forward by the orifice of the anus; branchiæ in form of a comb, on the *plafond* of the pulmonary cavity.

Shell rolled up longitudinally, very delicate, diaphanous, strongly carinated, with the aperture notched or slit anteriorly, and with a sharp edge; spire terminated by a *bouton*, at the bottom of the umbilicus, on the right side.

Operculum vitreous, delicate, fragile, bearing the muscular impression in its centre.

Two species only are known, natives of all warm seas.

NU'CLEUS is a botanical term strictly signifying the central succulent part of an ovule, in which the embryo plant is generated. It has also been applied to the point, or circle, visible on the side of a cell of cellular tissue, from which the cell itself is supposed to have developed, and which has recently been named cytoblast.

NU'CLEUS (a small nut), a term first given to the central and condensed portion of a comet, and thence to the central part of any appearance which is transparent towards the extremities and opaque towards the centre.

NU'CULA. [Polyodonta.]

NUDIBRANCHIA'TA, Cuvier's name for his second order of *Gasteropoda*, which he characterises as having no shell nor any pulmonary cavity, but naked branchiæ on some part of the back. They are all hermaphrodite and marine; often swim in an inverted position, with the foot at the surface concave, like a boat, aiding themselves with their mantle and tentacula as oars. M. Rang gives the following definition of the order, which he makes to consist of the following groups—*Tritonians* of Lamarck, *Polybranchiata* and *Cyclobranchiata* of De Blainville.

Animal furnished with a foot for creeping, and naked branchiæ on some part of the back, which are always symmetrical, whether they are found on the median line or occupy the sides of it; one or more pair of tentacles; both sexes in the same individual.

Shell null.

The last-named author also describes the order as consisting entirely of marine and hermaphroditic animals, some of them inhabiting the banks and creeping by means of their considerably sized foot, and others the deep sea, where they attach themselves to fuci by a narrow and elongated foot, or swim in the manner described by Cuvier.

We proceed to give some account of the families arranged under this order by M. Rang.

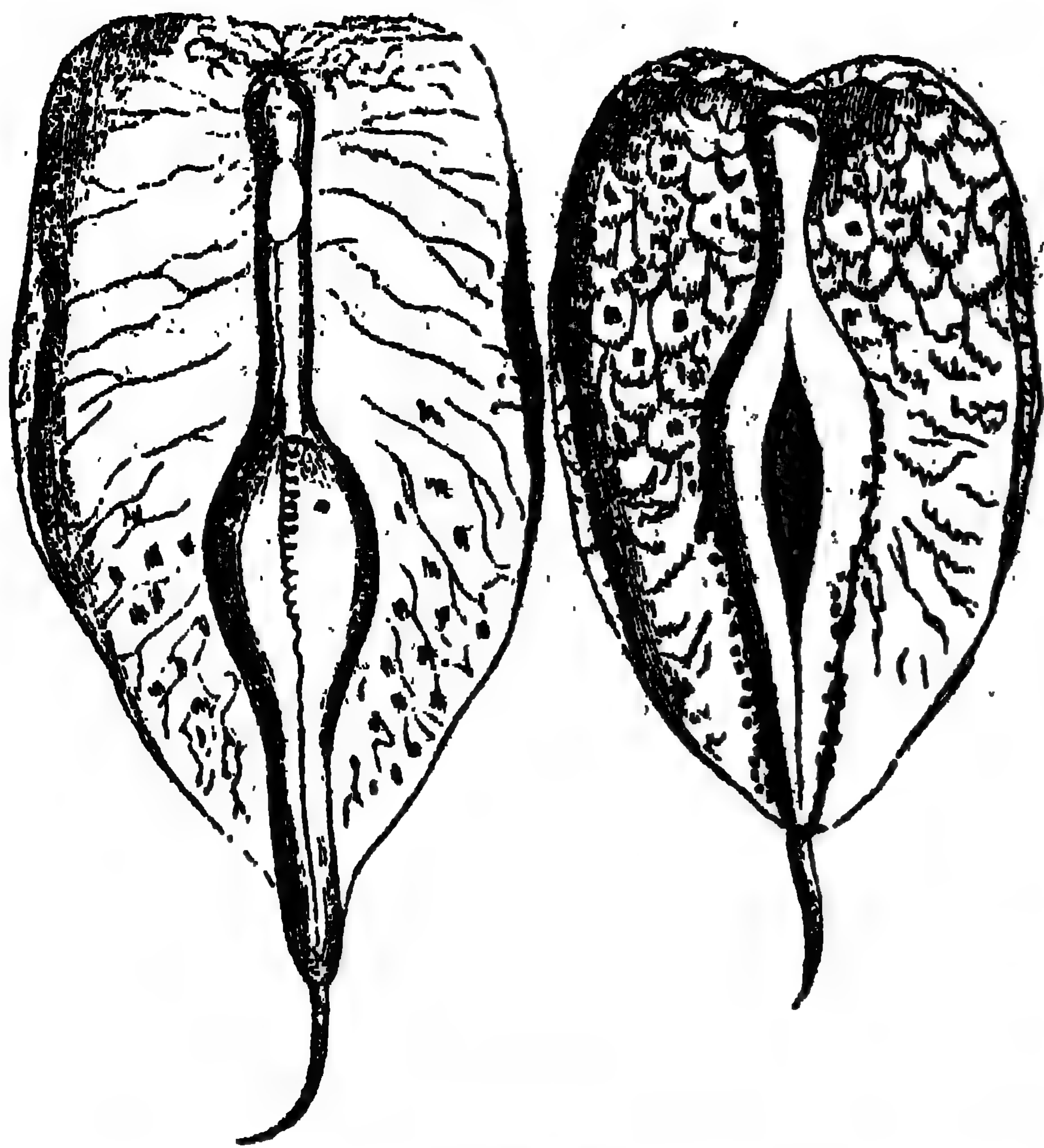
Pterosomatidæ.

M. Rang thus characterises his *Pterosomes*:—Animal very much flattened, furnished with a horizontal natatory membrane all round the body; no tentacles; branchiæ?

This family is established provisionally on a mollusk very incompletely known, on which M. Lesson founded his genus *Pterosoma*. M. Rang is of opinion that it seems intermediate between the *Nucleobranchiata* and the *Nudibranchiata*, and that it can hardly be referred to either of these orders.

Generic Character.—Animal pelagic, gelatinous, transparent, elongated, cylindrical, convex in the middle, surrounded by two natatory membranes, which are delicate, horizontal, originating at the tail, and continuing, in an oval form, beyond the head, where they unite in front of the mouth; anterior border thicker, and, as it were, truncated; posterior border narrowed and more delicate; mouth terminal, without a proboscis; eyes sessile, oblong, approximated; tail cylindrical and pointed; digestive organs appearing through the substance of the animal; branchiæ, anus, and organs of generation unknown.

This mollusk was discovered by M. Lesson in the equatorial seas, between the Moluccas and New Guinea, where it appeared abundant. It uses the membrane with which it is surrounded as a locomotive organ, and swims with great vivacity horizontally.



Pterosoma.

Glaucidæ. (*Tritoniens*, Lam.; Tétracères, Blainv.; Phyllobranches, Latr.)

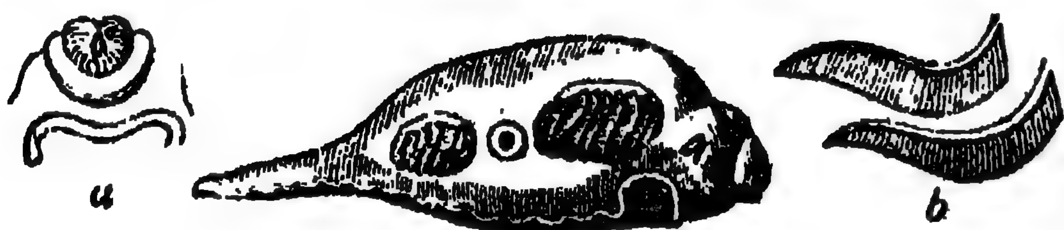
Animal furnished with two pair of tentacula, and sometimes three; branchiæ in form of strips or cirrhi.

Genera. Glaucus. (See the article.)

Laniogerus. (Blainv.)

Generic Character.—Animal with the body of nearly the same form as that of the *Glauci*, thick, and larger anteriorly, narrow and more delicate posteriorly, a gastropod, provided on each side with a series of soft laminæ finely pectinated, divided into two parts; mouth and tentacles as in *Glaucus*, as well as the termination of the digestive apparatus and that of generation.

M. Rang remarks that M. de Blainville established this genus on an individual in the British Museum, *Laniogerus Elfortii;* and the former remarks that the figure given by M. de Blainville recalls the appearance of those *Glauci* which M. Rang had preserved in spirit of wine, and which, having become more swollen, as always happens to them after death, have at the same time lost some of their branchial cirrhi.



Laniogerus Elfortii. (De Blainv.)
a, the mouth; *b*, the branchial cirrhi.

Briaræa. (Quoy and Gaim.)

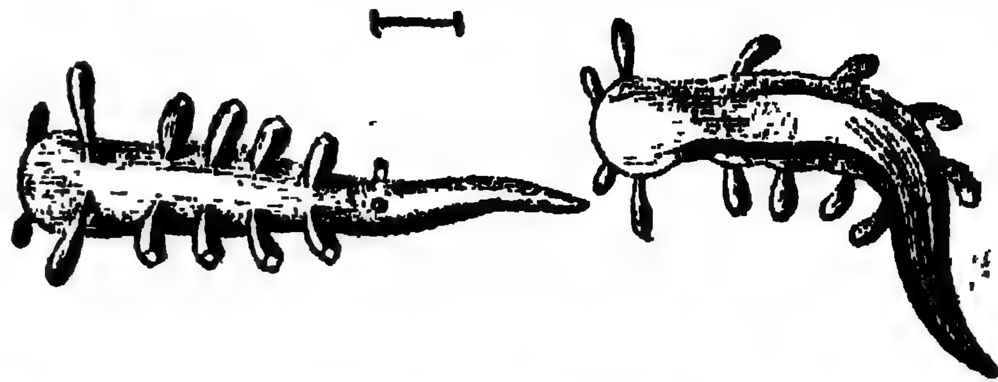
Generic Character.—Animal pelagic, gelatinous, transparent, scolopendriform, flattened, with two eyes? which are sessile, and four short tentacula, which are large and triangular, the posterior carrying at their extremity two sorts of very long filiform, elastic, and resisting antennæ; terminated behind by a tail; branchiæ disposed on each side and represented by flattened laminæ, bifurcated at their extremity, and decreasing in their length from the head to the tail, where they insensibly disappear; termination of the intestinal canal and of the organs of generation unknown.

M. Rang observes that the discovery of the genus *Briaræa* is certainly one of the most interesting of those of MM. Quoy and Gaimard. Though completely unknown, there is, he remarks, no doubt as to the place which this mollusk should occupy; for if its characters were insufficient for that conclusion, we should be led thereto by the circular form which it takes in its state of suffering, and which recals so well the genus *Glaucus* to those who have observed it alive. The only species known is *Briaræa Scolopendra*, found in the Straits of Gibraltar.

Eolidia. (Cuv.) (See the article.)

Tergipes. (Cuv., Blainv. *Æolis*, Ok.)

Generic Character.—Animal limaciform, gelatinous; head tolerably distinct and furnished with two pair of tentacula; foot entire, and occupying nearly its whole length; branchiæ in form of small clubs (massues), not numerous, disposed in two rows, one on each side of the back; termination of the intestinal canal and of the organs of generation as in the *Eolidiæ ?*



Tergipes laciniulatus.

M. Rang is of opinion that this genus is closely approximated to the *Eolidiæ*, with which, perhaps, it would be united if it was better known. Cuvier, indeed, observes M. Rang, states that each branchial organ of *Tergipes* is terminated by a small sucker, so as to serve them for a foot to creep on the back; but M. Rang thinks that this singular organization requires to be confirmed by observation on the living animal

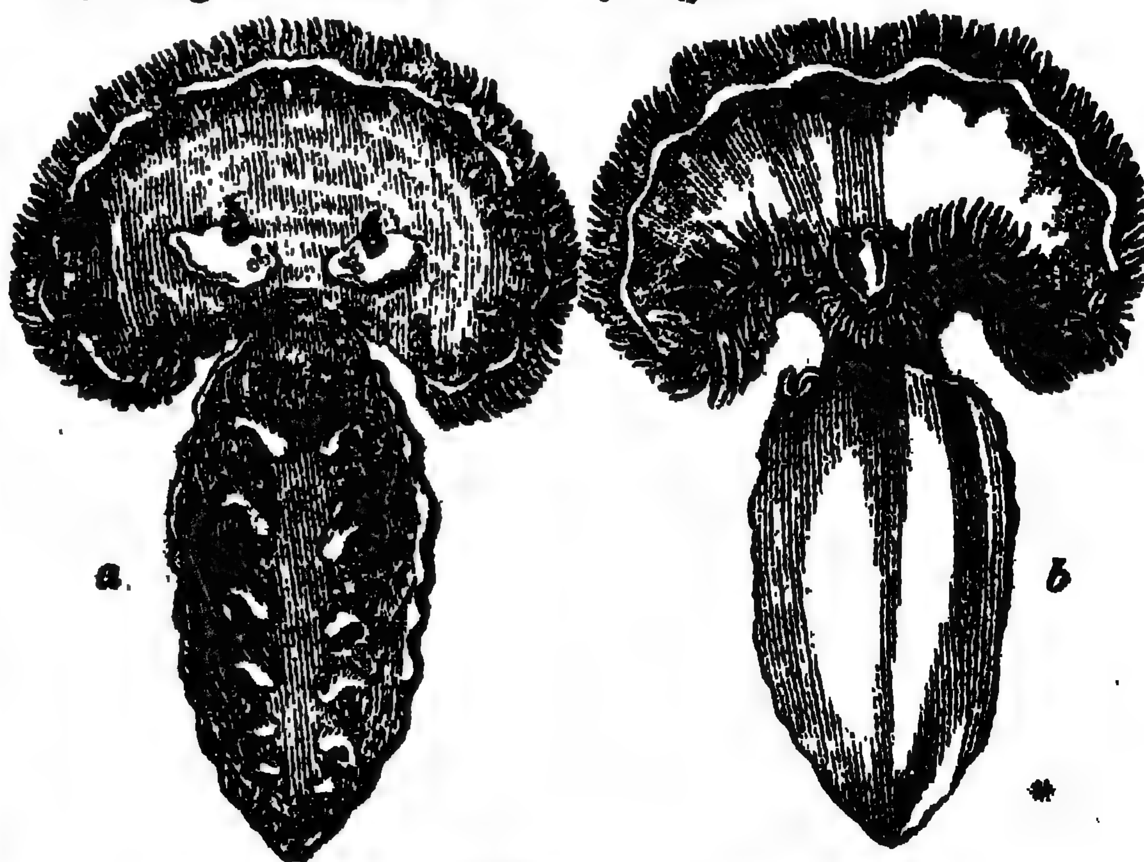
Tritonidæ. (*Tritoniens*, Lam.; *Dicères*, Blainv.; *Scribranches*, Lat.)

Animal with two superior tentacles, which are capable of being retracted into a kind of sheath at their base; a membranous veil more or less extended above the mouth; organs of generation and anus distant, on the right side; organs of respiration of various forms, but disposed on two longitudinal rows.

Tethys. (Linn.)

Generic Character.—Animal pelagic, gelatinous, and transparent; head distinct, and comprising a large membranous fringed veil, forming the funnel, shortened below, and from whose middle a small proboscis, terminated by the mouth, elevates itself: the tentacles, two in number, situated at the base of the veil, compressed, open at their summit to give passage to a small conical and retractile tube; foot very large; branchiæ formed by two longitudinal series of branched tufts, unequal alternately from right to left, and from front to rear; organs of generation united on the anterior portion of the right side; orifice of the anus placed more backwards.

Cuvier has thrown great light on this remarkable genus. The principal, and indeed, if we mistake not, the only recorded species, is a native of the Mediterranean, and lives far from the shore on banks of madrepore or on floating fuci, using its veil as a natatory organ.



Tethys leporina.
a, seen from above; *b*, seen from below.

Melibe. (Rang.)

Animal pelagic, gelatinous, transparent, and limaciform; head distinct, and comprising a membranous veil rolled into the form of a funnel, furnished internally with cirrhi, directed to the exterior, and from the middle of which a small

proboscis, terminated by the mouth, elevates itself; tentacles, to the number of two, situated at the base of the veil, very elongated, conical, and terminated by a small capsule, from which a conical and retractile organ has egress; foot as long as the animal, but very narrow, in form of a furrow; branchiæ not numerous, formed of two series of oblong club-shaped processes (massues), which are rounded at their summit, pediculated at their base, and covered with small tubercles; organs of generation united on the anterior portion of the right side; anus more backward. (Rang.)

M. Rang is of opinion that *Melibe* is doubtless very closely approximated to *Tethys*, with which he had confounded it; but subsequent observation made on the living animal has led him to the conclusion that there is a generic difference, founded on the entirely different organization of the branchiæ.

The animal, which swims very well by agitating the posterior parts of its body from side to side, lives upon the floating plants of the seas near the Cape of Good Hope, where M. Rang observed it alive for some time. The branchiæ fell on a slight touch. The species which serves for the type of the genus is *Melibe rosea*.



Melibe rosea.

b, veil which surrounds the mouth; *e*, tentacles; *g*, branchial club like processes; *h*, orifices of the organs of generation; *i*, orifice of the anu *l*, foot; *s*, caudal extremity.

M. Rang remarks that certain little animals found by M. Dorbigny on the coast of Rochelle, and which present as respiratory organs small club-like processes, disposed in two longitudinal and dorsal rows, may, perhaps, be added to this genus.

Scyllæa. (Lin.)

Generic Character.—Animal pelagic, gelatinous, very much compressed laterally; the head not very distinct, and of a horseshoe shape; two great tentacles in form of reversed horns (cornets), flattened, slit anteriorly, and open at the summit for giving passage to a small-pointed and retractile body; mouth at the extremity of a very small proboscis, armed with an apparatus proper for mastication; foot long and very narrow, in form of a furrow; branchiæ in form of small tufted pencils, scattered over the internal surfaces of many equal appendages (appendices pairs) of the skin, and on a caudal and median crest; orifice of the anus and of the organs of generation on the right side.

This genus is spread through all the warm seas, and is especially to be found on the *Fucus natans*. Its foot, like that of nearly all the animals of this family, is admirably contrived for embracing the leaves of these plants. Only two species appear to be recorded.



Scyllæa pelagica.

Tritonia. (Cuv.)

Generic Character.—Animal limaciform, with the head not very distinct, surmounted by two retractile tentacula, in a sort of case, carrying an arched frontal veil but little extended; the mouth armed with two lateral horny jaws, which are trenchant and denticulated on the edges; foot long and channelled; branchiæ in form of branching tufts, ranged in a longitudinal series on each side of the back; organs of generation united on the anterior portion of the right side; anus situated more backward.

These animals also attach themselves to marine plants. They are closely approximated to the *Scyllææ*, of whose habits they entirely partake, and also, in great part, of their organization. M. Rang observes that the species are not as yet well determined, though many exist upon the coast of France. Among these Cuvier has anatomically considered *Tritonia Hombergii*.



Tritonia Hombergii.

Doridæ. (*Tritoniens*, Lam.; *Cyclobranchiens*, Blainv.; *Urobranches*, Latr.)

Animal furnished with four tentacles, two of which are superior and two inferior, under the border of the mantle; organs of respiration arborescent, and forming a tuft round the anus.

The genera placed under this family by M. Rang are *Polycera*, *Doris*, and *Onchidoris*; these the reader will find described and figured in the article CYCLOBRANCHIATA.

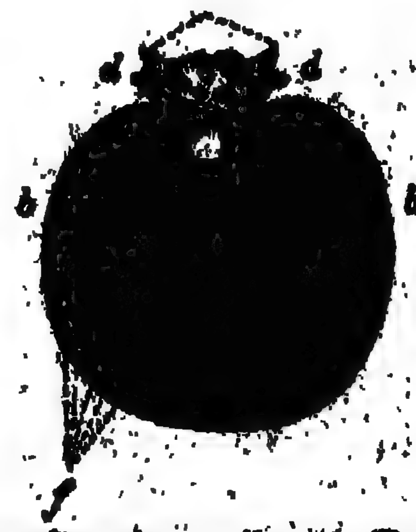
Placobranchidæ. (Rang.)

Animal with four tentacles, and furnished with two lateral membranous expansions proper for swimming, and hung (tapissées) above, as well as the whole dorsal surface, with branchial lamellæ.

Placobranchus. (Van Hasselt.)

Generic Character.—Animal oblong, cylindraceous, fleshy, with the mantle dilated on each side into two lobes or membranous fins, which are demicircular, embracing the whole length from the neck to the posterior extremity, and having the power of crossing themselves on the back, forming an internal canal open at both extremities; head not very distinct from the body, depressed, and carrying on its summit two small and approximated eyes; two pair of conical, not very elongated tentacles, the lower pair being a little flattened and triangular; mouth below slit longitudinally, and furnished on each side with a lamellar appendage; foot long, united to the mantle; branchiæ covering all the upper surface of the lobes and of the back, in the form of delicate, close-set, longitudinal lamellæ, and parting from a common centre at the anterior part; anus situated on the anterior portion of the right side; orifice of the sexual organs separated, that of the ovary a little before the anus, and that of the male organ at the base of the right tentacle.

This genus was founded on a mollusk discovered at Java by Van Hasselt a short time before his death. M. Rang, from such remarks as he could make on some specimens which were not well observed, confirms the exactness of the observations of Van Hasselt, though he is unable to add anything to his descriptions.



Placobranchus ocellatus. (Rang.)

c, upper tentacles *d*, lower tentacles, or labial appendages; *b*, lobes of the mantle serving for swimming; *f*, branchiæ.

Like the *Aplysiæ*, *Placobranchus* elevates and crosses the lobes upon the back, and thus forms a canal open at both

ends, in which the ambient element circulates, so as to impinge on the branchiæ with which it is hung. The species which serves for the type, *Placobranchus ocellatus*, is rather more than two inches long.

NUISANCE, or NUSANCE, is a term in English law derived immediately from the French *nuire*, and ultimately from the Latin *nocere*, 'to hurt;' and, conformably to its etymology, it signifies an unlawful act or omission which occasions annoyance, damage, or inconvenience to others. Nuisances may consist of injurious acts done, or of omissions to perform duties prescribed by law, and are of two kinds, *common* or *public* nuisances, which affect all the king's subjects, and *private* nuisances, which injure individuals. Instances of the former are, annoyances in highways, public bridges, or navigable rivers, which are produced by rendering the passage inconvenient or dangerous, either positively by actual destructions, or negatively by omitting to repair in cases where the law imposes the duty of repairing.

Noxious processes of trade or manufacture in towns are common nuisances by reason of the danger to the health of the inhabitants; and brothels, disorderly alehouses, gaming-houses, and unlicensed stage-plays are held to be common nuisances, both on account of the injury done by them to public morals and of the danger to the public peace by drawing together numbers of dissolute and irregular persons. The remedy for a public nuisance is by presentment or indictment; and the offender, upon conviction, may be punished by fine and imprisonment. It is said also that in the case of a positive obstruction to the free enjoyment of a public right, it may form part of the judgment that the offender shall remove the nuisance at his own cost; 'and it seemeth to be reasonable,' says Hawkins (book i., ch. 75, sect. 15), 'that those who are convicted of any other common nuisance should also have the like judgment.'

Private nuisances are annoyances which affect individuals only. Thus, if my neighbour builds a house so near to mine that he obstructs my antient lights, or throws the water from his roof upon my house or land, this is a private nuisance; so also if he keeps noisome animals, or sets up an offensive trade or hazardous manufactory so near to my dwelling-house that the free enjoyment of my property is interrupted either by injury to my health or comfort, or the apprehension of danger. The remedy for a private nuisance is an action upon the case, in which damages may be recovered according to the injury sustained.

NULLI'PORA. Lamarck designated by this term certain species of Linnæan Milleporæ on whose surface no distinct pores are visible. Since the investigation of Schweigger on one of the most conspicuous species (Millepora polymorpha, Linn.), many naturalists appear to be satisfied that these mucoso-calcareous bodies, much as they resemble Madrepores and Millepores in general form, are not of animal origin. Of this opinion is Blainville, and consequently, in his system, the Nullipores are rejected from the place so long assigned them by Linnæus, Pallas, and Lamarck.

NUMA POMPI'LIUS, the second king of Rome, was, according to tradition, a native of the Sabine town of Cures. On the death of Romulus the senate at first chose no king, and took upon itself the government of the state; but as the people were more oppressively treated than before, they insisted that a king should be appointed. A contest however arose respecting the choice of the king between the Romans and Sabines, and it was at length agreed that the former should choose a king out of the latter. Their choice fell upon Numa Pompilius, who was revered by all for his wisdom and knowledge, which, according to a popular tradition, he derived from Pythagoras.

Numa would not however accept the sovereignty till he was assured by the auspices that the gods approved of his election. Instructed by the camena, or nymph, Egregria, he founded the whole system of the Roman religion; he increased the number of augurs, regulated the duties of the pontifices, and appointed the flamines, the vestal virgins, and the Salii. He forbade all costly sacrifices, and allowed no blood to be shed upon the altars or any images of the gods to be made. To give a proof that all his institutions were established by divine authority, he is said to have given a plain entertainment in earthenware dishes to the noblest among his subjects, during which, upon the appearance of Egregria, all the dishes were changed into golden vessels and the food into viands fit for the gods.

Numa also divided among his subjects the lands which Romulus had conquered in war, and secured their inviolability by ordering land-marks to be set on every portion, which were consecrated to Terminus, the god of boundaries. He divided the artisans, according to their trades, into nine companies, or corporations. During his reign, which lasted thirty-nine years, no war was carried on; the gates of Janus were shut, and a temple was built to Faith. He died of gradual decay, in a good old age, and was buried under the hill Janiculum; and near him, in a separate tomb, were buried the books of his laws and ordinances.

Such was the traditional account of the reign of Numa Pompilius, who belongs to a period in which it is impossible to separate truth from fiction. According to Niebuhr and the writers who adopt his views of Roman history, the reign of Numa is considered in its political aspect only as a representation of the union between the Sabines and the original inhabitants of Rome, or, in other words, between the tribes of the Titienses and the Ramnes.

(Livy, i., 18-21; Dionysius of Halicarnassus, ii., 58-76; Cicero, *De Republica*, ii., 12-16; Plutarch's *Life of Numa*; the *Histories of Rome*, by Niebuhr, Arnold, and Malden.)

NUMA'NTIA, a celebrated town of the Celtiberi in Spain, was situated on the river Durius (Douro), at no great distance from its source. (Strabo, iii., p. 162; Appian, *Rom. Hist.*, vi. 91.) It appears to have been the capital of the Arevaci (Appian, vi. 46, 66, 76; Ptolem., ii. 6); but Pliny states that it was a town of the Pelendones, a people who lived a little to the north of the Arevaci.

Numantia was situated on a steep hill of moderate size. According to Florus (ii. 18), it possessed no walls, but it was surrounded on three sides by very thick woods, and could only be approached on one side, which was defended by ditches and palisades. (Appian, vi. 76, 91.) It was twenty-four stadia in circumference. (Appian, vi. 90). Its position has been a subject of considerable dispute; but it appears most probable that it was situated near the modern town of Soria.

Numantia is memorable in history for the war which it carried on against the Romans for the space of fourteen years. (Flor., ii. 18.) Strabo states that the war lasted twenty years; but he appears, as Casaubon has remarked, to include in this period the war which was carried on by Viriathus. (Strabo, iii. 162; and Casaubon's note.) The Numantines were originally induced to engage in this war through the influence of Viriathus. They were first opposed by Quintus Pompeius, the consul, B.C. 141, who was defeated with great slaughter (Oros., v. 4), and afterwards offered to make peace with the Numantines on condition of their paying thirty talents of silver. This negotiation was broken off by M. Popillius, who succeeded Pompeius, B.C. 139. Popillius however did not meet with any better success than his predecessor; he was ignominiously defeated, and obliged to retire from the country. His successors, Mancinus, Æmilius, Lepidus, and Piso, met with similar disasters; till at length the Roman people, alarmed at the long continuance of the war, appointed Scipio Africanus consul, B.C. 134, for the express purpose of the conquest of Numantia. After levying a large army, he invested the town; and having in vain endeavoured to take it by storm, he turned the siege into a blockade, and obtained possession of the place (B.C. 133), at the end of a year and three months from the time of his first attack. The Numantines displayed the greatest courage and heroism during the whole of the siege; and when their provisions had entirely failed, they set fire to the city, and perished amidst the flames.

(Appian, *Rom. Hist.*, vi.; Flor., ii. 17, 18; Livy's *Epitomes*; Plutarch's *Life of Marius*; Eutrop., iv. 17; Vell. Pat., ii. 4.)

NUMBER. The general considerations which this word would suggest cannot be treated independently of those required in treating the notion of ratio in general. As this will form a part of the subject of PROPORTION, we refer to that article as the continuation of the present one.

The notion of number is suggested by repetition or succession; and it is customary to call the actual things repeated, considered as a collection, a concrete number; while the notion formed from comparing the collection with one of the things collected is called an *abstract* number. This abstract number arises from repetition of objects, in

which the attention is directed to the repetitions as repetitions, and not to the objects as distinguished from any other objects. It is therefore a number of times, not a number of things. [MULTIPLICATION.]

If we never numbered any things capable of division into parts like themselves, our notion of number would rest in what is now called *whole* number. If the intellect were taught to count by the beating of a clock, and never came in contact with any other magnitude except that of the intervals between the beats, it is difficult to see how the idea of fractions would be obtained. But when we come to put together continuous magnitudes, which might increase or decrease without any alteration except that of magnitude, such as lines, surfaces, &c., we then begin to see that the unit is purely arbitrary, considered as a magnitude, so that the consideration of smaller or larger units, and the reduction of processes from one unit to another, become necessary. Hence the doctrine of fractions, and finally that of INCOMMENSURABLES.

The unit of magnitude and the unit of repetition are as distinct as concrete and abstract number. A given magnitude being chosen, we may fix our own ideas of other magnitudes and convey them to other persons by describing the repetitions of the given unit which will severally give the other magnitudes: but it is incorrect to say that in arithmetic we can operate upon magnitudes represented by numbers; the operations are performed by our minds upon notions of repetition, not of magnitude. Any question of numbers arising out of geometry might, so far as the pure arithmetical processes are concerned, as well have the prototypes of its numbers in collections of beats of a clock or motions of the arm, as in repetitions of lengths or areas. It is not true that such simple successions would suggest as many problems as geometry or commercial business; but that is a distinct consideration.

Discussion formerly took place upon the question whether 1 represents a number; it being asserted that *number* must be *more than one*. The settlement of such a question depends upon convention entirely, and is very easy. In the common sense of the word neither 1 nor 2 are numbers: a number of men, or of pebbles, would suggest the idea of more than two: in fact, number means indefinitely many; more than the eye can decide on without counting; *several*, that is to say, as many as require the *severing* which takes place in counting. With different persons this commencement of number, vulgarly speaking, may be different; all persons discern *three* without counting, and probably *four*; but it is certain that *five* must be severed by most persons, and *six* probably by all. Those who watch the progress of children can easily see that their scales of reckoning are successively one and more; one, two, and more; one, two, three, and more.

In the common playing-cards we decide by forms, not by numbers; and were not the nine distinguished from the seven by the different positions of the odd spot, there would be continual mistakes.

In mathematical language, every numerical symbol is called number, including 0, 1, fractions, whole numbers, and even *infinity*.

The talent of easily combining and remembering numbers, or of calculation, is a perfectly distinct thing from that of mathematical invention, reasoning, or application; though the two are frequently confounded. Taking mathematicians of the highest order, some have been singularly gifted in this respect, some distinguished in neither way, and some more than commonly deficient.

A very deceptive mode of speaking is common with regard to numbers, which divides them into *cardinal* and *ordinal*. Thus *one, two, three*, &c. are cardinal numbers, while *first, second, third*, &c. are ordinal. The real distinction is that of numeral *nouns* and numeral *pronouns*, to the latter of which the term ordinal might properly be applied. That first, second, third, &c. are really pronouns is obvious if we consider that, so far as they go, *this*, *that*, and *the other* would supply their places. The so-called cardinal numbers denote collections; the ordinal numbers point out only the places of the several units of which a collection is composed. Even *one*, when its force is simply selective or distinctive, is a pronoun, as in 'one or another.' [ARITHMETIC; MAGNITUDE; PROPORTION; QUANTITY; UNIT.]

NUMBERS, APPELLATIONS OF. Various names have been given to classes of numbers, each expressive of properties common to all in its class: they are pointed out in the following list:—

The whole scale, 1, 2, 3, &c., is called that of *natural* numbers; it is subdivided into the scale of *odd* numbers, 1, 3, 5, &c., and *even* numbers, 2, 4, 6, &c. These again are subdivided into *oddly odd* numbers, 3, 7, 11, &c.; *evenly odd* numbers, 1, 5, 9, &c.; *oddly even* numbers, 2, 6, 10, &c.; and *evenly even* numbers, 4, 8, 12, &c. These latter appellations are not in universal use, though they are very convenient. Thus with reference to division by two and by four, all numbers have names; but not with reference to any higher numbers. The expression of a number which divided by m leaves a remainder n (namely, $mx + n$, where x is a whole number) is so simple, that it is more easily written than described. When 0 is included in the list, it is considered as divisible without remainder by every number.

The division of numbers into *square* numbers, 1, 4, 9, 16, &c.; *cube* numbers, 1, 8, 27, 64, &c.; *fourth powers*, 1, 16, 81, 256, &c., and so on, may be carried to any extent.

A *prime* number is any one of the list 1, 2, 3, 5, 7, 11, 13, &c., no one of which is divisible by any number except unity and itself. A *composite* number is any one which is not prime.

A *figurate* number is any one out of any of the following series, the first excepted, which is only introduced as a basis.

	1	2	3	4	5	6	&c.
I.	1	3	6	10	15	21	&c.
II.	1	4	10	20	35	56	&c.
III.	1	5	15	35	70	126	&c.
IV.	1	6	21	56	126	252	&c.
V.	1	7	28	84	210	462	&c.
&c.				&c.			&c.

Each number is the sum of the numbers in the preceding row: thus 84 is the sum of 1, 6, 21, and 56, and 84 is the fourth number of the fifth order of figurate numbers. The nth number in the first order is $n\frac{n+1}{2}$, in the second order $n\frac{n+1}{2}\frac{n+2}{3}$, in the third $n\frac{n+1}{2}\frac{n+2}{3}\frac{n+3}{4}$ and so on.

Polygonal numbers, as their name imports [POLYGON], may be subdivided into triangular, quadrangular, pentagonal, hexagonal, &c. To find the numbers which bear the name of an n-sided figure, form a series beginning with 1 and consisting of terms increasing in arithmetical progression, with a common difference $n-2$: and form the sums of terms of these series in the manner described. Thus for decagonal numbers, we have—

1	9	17	25	33	41	&c.
1	10	27	52	85	126	&c.

and the decagonal numbers are 1, 10, 27, &c. The mth number of the n-sided order of figures is

$$1 + nm\frac{m-1}{2} - (m-1)^2$$

The following are some of the polygonal numbers:—

Triangular	1	3	6	10	15	21	&c.
Quadrangular	1	4	9	16	25	36	&c.
Pentagonal	1	5	12	22	35	51	&c.
Hexagonal	1	6	15	28	45	66	&c.

Pyramidal numbers are formed by summing the polygonal numbers; thus to find pentagonally pyramidal numbers, take the pentagonal numbers—

1	5	12	22	35	51	&c.
1	6	18	40	75	126	&c.

Numbers were once considered as *abundant*, *perfect*, and *defective*. An abundant number was one in which the sum of all its divisors (unity included, but not itself) exceeds the number: thus 12 is an abundant number, because 1 + 2 + 3 + 4 + 6 is greater than 12. A perfect number was one in which the sum of all the divisors was equal to

the number: thus 6 is 1 + 2 + 3, and is a perfect number, as is 28, or 1 + 2 + 4 + 7 + 14. A defective number was one in which the sum of the divisors is less than the number, as 10, in which 1 + 2 + 5 is less than 10. Whenever $2^n - 1$ is a prime number, then $2^{n-1}(2^n - 1)$ is a perfect number; thus $2^7 - 1$, or 127, is a prime number, whence $2^6(2^7 - 1)$, or 64 × 127, or 8128, is a perfect number.

Amicable numbers are those each of which is equal to the sum of all the divisors of the other. Such are

284 and 220
17296 and 18416
9363583 and 9437056.

Other names have been invented descriptive of classes of numbers; but the preceding are those which most often occur in the past history of mathematics. With the exception of SQUARE, CUBE, PRIME, *even*, and *odd*, the preceding appellatives rarely appear in modern works.

NUMBERS, FIGURATE AND POLYGONAL. [NUMBERS, APPELLATIONS OF.]

NUMBERS, THEORY OF. The theory of numbers is in fact the science of whole or integer numbers, and its most general problem is: 'Given any equation whatsoever involving two or more unknown quantities, or any number of equations between a greater number of unknown quantities, to determine every possible solution in which the values of the unknown letters are whole numbers.' It may also be considered that the science extends to the determination of all solutions which contain nothing but rational or commensurable fractions, all surd quantities or incommensurables being excluded. If, for example, the equation $x^3 + y^3 = 1000$ were to be solved, x and y being whole numbers or rational fractions, let the rational fractions reduced to a common denominator be $p : z$ and $q : z$; then the equation becomes $p^3 + q^3 = 1000\,z^3$; and if all possible whole values of p, q, and z be found, all the fractional solutions of the former equation can be exhibited.

Connected with the science before us is a very large quantity of properties of numbers, of which it must be said that they can be proved easily enough, but cannot be explained. Usually in retracing the steps of an algebraical demonstration, we can easily connect the result with common and self-evident notions, which seem both to justify the conclusion, to render it natural, and destroy much of the curiosity, and even interest, with which it is looked at by a person used to algebra, who hears of the conclusion for the first time. In the theory of numbers it seems to us that the curious character of the conclusions is not so much lessened by the demonstrations, and perhaps this may be the reason why the science becomes a sort of passion, as Legendre remarks, with most of those who take it up. The instances given by the writer just cited, in his preface, will show the sort of properties which we speak of. If c be any prime number, and N any other number not divisible by c, then $N^{c-1} - 1$ is always divisible by c. Then $2^6 - 1$, or 63, is divisible by 7. Again, if any prime number divided by 4 leave a remainder 1, it is the sum of two square numbers: thus 13 is the sum of 9 and 4, 17 of 16 and 1, 29 of 25 and 4, &c.

The theory of numbers is not of much immediate practical utility in the applications of mathematics, which generally involve continuously increasing magnitude, and in which therefore the introduction of whole numbers is matter of convenience, and not of necessity. Again, the data of such applications are usually only approximate, so that an answer in whole numbers, should such a thing occur, is not exact, and possesses no particular interest. Hence this theory is little studied by a very large class of mathematicians, among whom it is not uncommon to meet with a person deeply versed in the higher analysis, who does not even know the principal results obtained by Gauss or Legendre. The subject is, in fact, an isolated part of mathematics, which may be taken up or not, at the choice of the student. It may possibly at some future time be connected with ordinary analysis, that is to say, the determination of the *integer* solutions of a set of equations may not be so distinct a thing from that of a mere solution, integer or not, as it is at present. In fact a hint given by M. Libri, in a tract presently to be cited does give completely the means of assimilating the expression of a problem in this theory to that of one in ordinary analysis. Suppose, for example, it is required to solve in whole numbers the equation $x^2 + y^2 = z^2$. Let π represent two right angles; then it is well known that $\sin \pi x = 0$ when x is a whole number, and never else; so that 'required a solution of $x^2 + y^2 = z^2$ in whole numbers' is precisely the same problem as 'required any solution of the three equations $x^2 + y^2 = z^2$, $\sin \pi x = 0$, $\sin \pi y = 0$.'

The earliest consideration of the theory of numbers may have been made in India [VIGA GANITA]; but the earliest treatise is probably that of Diophantus, which consists of nothing else but problems of this science, insomuch that the theory itself has been sometimes called the Diophantine analysis. The subject then rested, without making any progress, until the time of Bachet de Meziriac and FERMAT, the editor and commentator of Diophantus. The subject rested again until the time of the man who literally left no part whatever of mathematics unaugmented, Euler. After him, Lagrange, Legendre, and Gauss applied themselves contemporaneously to this theory. The works of the two latter are the separate treatises on this particular science, in which the advanced mathematical student must look to know its present state. Various Memoirs of MM. Cauchy and Libri may also be mentioned; one in particular by the latter (in the 'Mémoires de Mathématique et de Physique,' vol i., Florence, 1829), in which the subject is made to have more resemblance than usual to ordinary analysis.

The 'Disquisitiones Arithmeticæ' of Gauss (Brunswick, 1801) were translated into French by M. Poullet-Delisle (Paris, 1807). The 'Théorie des Nombres' of Legendre (third edition, Paris, 1830) has the advantage of coming later than that of Gauss (which itself came after the first edition of Legendre's), and of using methods and notations which are more familiar to the mathematician. Both are works of great originality: that of the German is condensed, and full of historical information; that of the Frenchman easier to follow, but, like most French works, deficent in precise historical reference. It is not a little singular that the two great writers on this subject should have been the men who, independently of each other, introduced the method of LEAST SQUARES.

For a notice of one prominent discovery of Gauss, see POLYGON and ROOT.

The beginner in algebra may obtain some command over equations of a simple character, not exceeding the second or third degree, by a method which is, we believe, due to Playfair, or which, at least, is published in the collection of his works. Let the equation be, for instance, $ay^2 + bxy + x^2 = z^2$, in which x, y, and z are to be whole numbers. Throw the equation into a form which admits of both sides being reducible into factors; for instance,

$$y(ay + bx) = (z - x)(z + x).$$

If then $z - x = vy$, we have $z + x = (ay + bx) : v$, which equations give

$$x = \frac{(a - v^2)\,z}{a - bv + v^2} \qquad y = \frac{(2v - b)\,z}{a - bv + v^2}$$

Assuming v at pleasure, z may be easily taken so as to make both x and y whole numbers; and the same method will succeed in many equations.

NUMBERS OF BERNOULLI. This name is given to certain numbers (we here see the mathematical use of the word, for they are all fractions) first used by James Bernoulli, in his 'Ars Conjectandi.' They are in fact (though not so considered by Bernoulli) the coefficients of the powers of x in $1 : (\varepsilon^x - 1)$. We should hardly have given them a place here, as our list of such ultimate references in mathematics is by no means complete, if it were not that they only appear to a sufficient extent in one English work that we know of (Peacock's Examples). Let

$$\frac{1}{\varepsilon^x - 1} = \frac{1}{x} - \frac{1}{2} + \frac{B_1 x}{2} - \frac{B_3 x^3}{2.3} + \ldots.$$

a form which it is shown to take. Then B_1, B_3, B_5 &c. are what are called the numbers of Bernoulli, and the following list will show twenty-five of them, the first column being the index of B, the second the numerator of the fraction, and the third its denominator. As far as B_{29} these are taken from Euler's Differential Calculus, all the rest (and the logarithms) from Grunert's Supplement to Klugel, which professes to take the additional numbers from a work of H. A. Rothes, and the logarithms from Eytelwein's work on the higher analysis:—

No.	Numerator.	Denominator
1	1	6
3	1	30
5	1	42
7	1	30
9	5	66
11	691	2730
13	7	6
15	3617	510
17	43867	798
19	174611	330
21	854513	138
23	236364091	2730
25	8553103	2
27	23749461029	870
29	8615841276005	14322
31	7709321041217	510
33	2577687858367	6
35	26315271553053477373	1919190
37	29299939138[illegible]559	6
39	261082718496449122051	13530
41	1520097643918070802691	1806
43	27833269579301024235023	690
45	596451111593912163277961	282
47	5609403368997817686249127547	46410
49	495057205241079648212477525	66

Thus the coefficient of x^{15} : 1.2.3...15 in the development of 1 : $(\epsilon^x - 1)$ is 3617 : 510, or B_{15}. The logarithms of the first eighteen numbers are as follows —

No.	Logarithm.
1	0·2218487496 − 1
3	0·5228787453 − 2
5	0·3767507096 − 2
7	0·5228787453 − 2
9	0·8794260688 − 2
	0·4033154004 − 1
13	0·0669467896
5	0·8507783387
17	1·7401350433
19	2·7235576597
21	3·7918359878
23	4·9374188514
25	6·1539724516
27	7·4361345055
29	8·7792940212
31	10·1794459554
33	11·6330790734
35	13·1370898829

The higher numbers may be approximately verified by the following rule. Let π be the ratio of the circumference of a circle to its diameter; then

$$B_{2x-1} = 2\,\frac{1.2.3\ldots\ldots2x\cdot1.2x}{(2\pi)^{2x}} \text{ nearly.}$$

We shall have some occasion to point out the uses of the numbers of Bernoulli in the article SERIES, in which also misprints, if any should occur, in the preceding tables will be noted. The theory of these numbers will be found in Peacock's translation of Lacroix, Euler's 'Differential Calculus,' Lacroix's 'Differential Calculus,' 3 vols., and in a very elaborate article ('Bernoullische Zahlen') in the work of Grunert already cited.

NUMBERS, THE BOOK OF, one of the books of the Pentateuch. In Hebrew it has two titles, וַיְדַבֵּר, *and he spake*, which is the first word of the book, and בְּמִדְבַּר, *in the desert*, which is the fifth word in the first verse, and which applies to the whole book, inasmuch as the events which it records took place in the desert. Its title in the Septuagint is 'Αριθμοί, *Numbers*, because it contains the censuses of the people of Israel (chaps. i.-iii., and xxvi.).

The first four chapters of this book consist of separate accounts of commands given by God to Moses, while the Israelites were encamped at the foot of Sinai, respecting the census and the classification of the people, and the duties of the priests and Levites. The succeeding chapters (v.—x. 10) contain various laws, most of which are additions to those before given in the books of *Exodus* and *Leviticus*; and the rest of the book is occupied with the narrative of the journeys of the Israelites, from the time of their leaving Sinai to their second arrival at the Jordan, and their encampment in the plains of Moab. The time over which the book extends is from the first day of the second month of the second year after the departure from Egypt, to the first day of the eleventh month of the fortieth year of the same epoch. This part of the book also contains various enactments.

We learn from the last verse of the last chapter that this book was written by Moses 'in the plains of Moab by Jordan near Jericho,' and consequently just before his death. Vater has attempted to show that it is composed of short narratives written by different persons (vol. iii., p. 452, &c.), and De Wette adduces several passages which appear to disagree with each other, and with the parallel passages in the book of *Exodus*. (*Lehrbuch d. Hist. Krit. Einleitung in d. A. T.*, p. 180.)

This book is quoted or referred to in the New Testament (compare *Numb.*, xx. 11, with 1 *Cor.*, x. 4, and *Numb.* xxi. with *John*, iii. 14). The passage in chap. xxiv. 17-19, is generally understood as a prediction of the Messiah.

(Rosenmüller's *Scholia in Vet. Test.*, the *Introductions* of Eichhorn, Jahn, De Wette, and Horne; Graves's and Vater's *Commentaries on the Pentateuch.*)

NUME'NIUS. [SCOLOPACIDÆ.]

NUMERAL CHARACTERS. There are three simple and obvious modes of constructing symbols of number. 1. By arbitrary invention. 2. By the choice of letters of the alphabet. 3. By a system of repetitions of a single unit, as I, II, III, IIII, &c., with marks of abbreviation. Some may doubt whether the first and third were ever really employed; but it is not known that we can assign to the Indian numerals any other origin than the first, and the third explains the Roman system with a degree of consistency which is most extraordinary, if it be only accidental coincidence.

Distinct numeral characters are found to have existed or to exist among the Chinese, Indians, and Arabs, &c., Phœnicians, Palmyrenes, Hebrews, Egyptians, Greeks, and Romans; and others are given as in antient use among the Mexicans. Various representations of these will be found in the 'Encyclopædia Metropolitana,' article 'Arithmetic.' We shall here confine ourselves to the simplest explanation of those systems which will be wanted by the student of antient literature. Of these, as it should seem, the Indian system may belong (though it may be doubted) to the first class; the Hebrew and the common Greek system to the second; the Roman, Phœnician, Palmyrene, antient Greek, Egyptian, and Chinese, to the third class.

The system received from the Hindus through the Arabs, and now adopted throughout Europe, has been gradually much altered in the forms of the symbols. [ARITHMETIC.]

The Hebrews used the letters of their own alphabet, giving the finals a separate and particular value, as follows:—

Letter	א	ב	ג	ד	ה	ו	ז	ח	ט	י
Numeral Signification ..	1	2	3	4	5	6	7	8	9	10
	כ	ל	מ	נ	ס	ע	פ	צ	ק	
	20	30	40	50	60	70	80	90	100	
	ר	ש	ת	ך	ם	ן	ף	ץ		
	200	300	400	500	600	700	800	900		

The use of the final letters as signifying numbers is of newer date than the rest; the old system required the junction of subordinate numbers to express 500, 600, &c. Numbers not expressed above were made by juxta-position of letters denoting other numbers, according to a decimal subdivision, as among the Greeks; the only exception being 15, which, as 10+5 or [illegible] made a word signifying the Creator, they wrote as 9+6, or [illegible]. In a language like the Hebrew it would be impossible to prevent every combination of numbers from also standing for a word or words; and the Oriental nations accordingly have frequently expressed dates by sentences. Thus 'Hooshung Shah is no more,' rendered into Persian, expresses, in the numeral force of the letters, the year 837 of the Hegira, the date of the death of that prince.

The Greeks, in some enumerations, have three distinct methods of expressing numbers; but the first of them, which consists in the use of the letters of the alphabet to denote the successive books of a work, as in the Iliad, is as much a method of naming as of counting. Something more to the point is the old system, which occurs on inscriptions,

in which the unit is represented by a single mark, five by Π (the initial of ΠΕΝΤΕ), ten by Δ (that of ΔΕΚΑ), and 100 by Η (that of ΗΕΚΑΤΟΝ). And in all cases five of any symbol are written by inclosing the symbol in Π: thus [Δ] is five tens, and [Η] is five hundreds. Thus 879 is [Η]ΗΗΗ[Δ]ΔΔΠΙΙΙΙ. This antient Greek method, as found on inscriptions (which, according to Heilbrunner, is alluded to in a written work by Herodian only), is supposed to be as old as the time of Solon. The Egyptian hieroglyphic system is on the same principle, but without abbreviations; the symbol of ten resembling that just given for five.

In describing the later Greek notation, we leave out of view the extensions made by the mathematicians, the principle of which is described in ARITHMETIC. It appears most distinctly that the system was made either at a time when the Greek alphabet was in possession of more letters than it permanently retained, or that it was introduced into Greece by communication with some nation (the Phœnician, perhaps) which had some additional letters. The *Vau* of the Hebrew and Phœnician, which stands for six, and is wanting in the Greek alphabet, appears in their numeral system under the name of ἐπίσημον βαῦ, and is expressed by a symbol resembling ϛ, not very unlike the Vau turned the other way. The Koph and Tsaddi appear under the names of ἐπίσημον κοππὰ and ἐπίσημον σανπὶ, with symbols expressed in our types by ϟ and ϡ; but the former is one behind its place in numeral signification, being 90 among the Greeks and 100 in the East: the latter takes the same numeral place as the final Tsaddi in the Hebrew system. The word *air* will be a useful guide to the letters beginning the several scales, as follows:—

Letter	α	β	γ	δ	ε	ϛ	ζ	η	θ
Numerical Signification	1	2	3	4	5	6	7	8	9
	ι	κ	λ	μ	ν	ξ	ο	π	ϟ
	10	20	30	40	50	60	70	80	90
	ρ	σ	τ	υ	φ	χ	ψ	ω	ϡ
	100	200	300	400	500	600	700	800	900
	,α	,β	,γ	,δ	,ε	,ϛ	,ζ	,η	,θ
	1000	2000	3000	4000	5000	6000	7000	8000	9000

The Roman notation, including all the varieties which occur in printed works, is as follows:—

1	I	50	L
2	II	60	LX
3	III	70	LXX
4	IIII, IV	80	LXXX, XXC
5	V	90	LXXXX, XC
6	VI	100	C
7	VII	200	CC
8	VIII, IIX	300	CCC
9	VIIII, IX	400	CCCC
10	X	500	D, IↃ
11	XI	600	DC, IↃC
12	XII	700	DCC, IↃCC
13	XIII, XIIV	800	DCCC, IↃCCC
14	XIIII, XIV	900	DCCCC, IↃCCCC
15	XV	1000	CIↃ, M, ∞, Ī
16	XVI	2000	CIↃCIↃ, IICIC, IIM
17	XVII	5000	IↃↃ, V̄
18	XVIII, XIIX	10000	CCIↃↃ
19	XVIIII, XIX	50000	IↃↃↃ
20	XX	100000	CCCIↃↃↃ
30	XXX	1000000	CCCCIↃↃↃↃ
40	XXXX, XL		

The grammarian Priscian would have it that I denoted unity, because the Greek word μία, with μ cut off, has ι for its first letter; that V is five, as being the fifth vowel, and X ten, as being the tenth consonant, of the Greek alphabet. Any explanation of this system which endeavours at an alphabetical deduction must, as far as has yet been seen, fail entirely in giving a probable origin. The following scheme however contains suggestions of some antiquity, and certainly, as before remarked, is either a true explanation or a most extraordinary coincidence:—



Imagine a person used to decimal counting by means of the fingers having recourse to simple counting by making a mark for each successive unit, as in *a*, *b*, *c*, &c. At ten he might be expected to make some symbol that his *handful* was completed, and the drawing a mark through the whole ten unit symbols, as at *e*, would do very well. This he might abbreviate, as at *f*, retaining only the symbol of a unit and that of the line drawn across. The handful of tens, or one hundred, might be represented by retaining only the unit symbol and two ligatures, namely, that of the tens and that which made all the ten tens into one symbol, as at *g*. The ten hundreds would require a unit with three ligatures, or four strokes altogether, which, if they were written without taking the pen off, might be made as at *h*, which might degenerate into *k*, and finally into *l*. Again, by cutting *l* into two halves, we have *m* or *n*, which might suggest themselves as proper representatives of half a thousand, or five hundred. Similarly bisection of *f* and *g* or of *o* and *q* would suggest *p* and *r* as proper symbols for the halves of ten and one hundred. The symbol *a* has a resemblance to I, *f* to X, *g* to C, *h* to M, *m* to D, *p* to V, and *r* to L.

We cannot find any precise information upon the time of the commencement of the principle of local value which prevails to a certain extent throughout the Roman system, namely, that a smaller symbol before a larger one, in numbers less than one hundred, denotes a subtraction, after it an addition. This principle does not appear in the Phœnician or Palmyrene notations, which otherwise much resemble the Roman in their principle of notation, though they approximate to pure vicenary scales, both adopting distinct symbols for twenty.

The Chinese use three systems: the first, not very simple, and antient; the second, intentionally complicated, and employing symbols of words to denote numbers, is introduced in deeds and other instruments, to render alteration difficult; the third, a simplification of the first, supposed to have been made by the Jesuit missionaries.

For further information on the subject of this article, with abundant references, see the article 'Arithmetic' in the 'Encyclopædia Metropolitana,' by Dr. Peacock.

NUMERATION is a term generally applied to the art of representing numbers by distinct names and symbols, a sense in which the word is used by the oldest writers. Every treatise on arithmetic must necessarily begin with something on this art of counting and representing the results of counting, on the goodness of which, slight and easy as any method may appear to which we have been habituated from childhood, the progress of the arts of life, to say nothing of the mathematical sciences, is in no slight degree dependent. The time is gone by for a formal eulogy upon the benefits of any fundamental method of expression; we will therefore content ourselves with quoting a part of that which is found in the first English work on arithmetic, Robert Recorde's 'Grounde of Artes' (1551, perhaps 1540). We quote this also because it is an instance (the only one we ever met with in a mathematical work) of the species of doggrel comic verse afterwards in use on the stage (see the 'Comedy of Errors'), which has a sort of measure and rhyme, though printed in the form of simple prose in the work from which we cite (we put the syllables which are meant to rhyme in italics). '*Master.* Wherefore in all great workes are clerks so much desi*red*? Wherefore are auditors so richly *fed*? What causeth geometricians so highly to be *inhaunsed*? Why are astronomers so greatly *advanced*? Because that by number such things they *find*, which else would far excel man's *mind*. . . . *Master.* Exclude number, and answer to this question: How many years old are you? *Scholar.* Mum. *Master.* So that if number want, you answer all by *mummes*? How many miles to London? *Scholar.* A poak full of *plums*. . . . . *Master.* If number be lacking, it maketh men *dumb*, so that to most questions they must answer *mum*. *Scholar.* This is the cause, sir, that I judged it so *vile*, because it is so common in talking every *while*; for plenty is not dainty, as the common saying *is*. *Master.* No; nor store is no sore, perceive you *this*? The more common that the thing is being needfully *required*, the better is the thing and the more to be *desired*. But in numbring, as some of it is light and *plain*, so the most part is difficult and not easie to *attain*.'

The earliest method of signifying a large number must have been such a one as the scholar uses above, when he designates a large number of miles as a 'poak full of plums,' namely, the similitude of some visible or well-known collec-

tion of units. The fingers of the hand, or of both hands, or the united number of fingers and toes, furnished natural collections of reference on which the various quinary, decimal, and vicenary scales in existence have proceeded. The transition from counting by tens to counting by dozens might have been caused by the facility of subdivision which the number twelve possesses, though we rather doubt this explanation, at least unless we assume that the division of the Roman *As* into twelve *unciæ* is to be explained on the same principle. From this we think came the method of reckoning by dozens to be introduced throughout Europe, as would that by thirteens, if the Roman coin or weight had been so divided.

Our present numerative system is stated by writers to employ the words unit, ten, hundred, thousand, million, billion, trillion, quadrillion, quintillion, sextillion, septillion, octillion, nonillion, &c. But the greater part of this is pure statement; for the terms billion, trillion, &c., though defined by arithmetical writers, have never found their way into common use, the want of such large numbers having never been experienced. The French indeed have naturalised the term *milliard*, meaning one thousand millions, in matters of public debt and revenue, which only shows how little the term *billion* has been used among them, since, according to their writers, the milliard and billion are the same things. Tonstal expressly says, that in his time (Henry VIII.) the common reckoning from millions was made by millions of millions, &c., and the word *millio* is noted as a vulgarism by him (neither is it among the recognised barbarisms of Ducange). Recorde uses nothing more than millions repeated; so that it seems the billions and higher denominations were never anything but a fancy of arithmetical writers, conceived after the time when elementary works ceased to be written in Latin. The probability of this is increased by their meaning different things in different countries: with us the billion is a million of millions, a trillion is a million of billions, and each denomination is a million of times the one preceding; with the French and the other continental nations the billion is a thousand millions, and each denomination is a thousand times the preceding. According to English writers, the number 1,234567,891234,567891 is one trillion, 234567 billions, 891234 millions, and 567891: according to the French writers, it is one quintillion, 234 quadrillions, 567 trillions, 891 billions, 234 millions, 567 thousands, and 891. For common purposes the denominations higher than a million may be abandoned, it being remembered that all the figures on the left, after six are taken off on the right, are so many millions, and all above twelve figures so many millions of millions. In writing, round numbers of millions should be written as such, thus, 638 millions, not 638,000,000: in computation it is of course a different thing. Some authors seem to think it very scientific to parade ciphers, sometimes by the dozen, and so it is, no doubt, since it shows they know how many ciphers go to a million or a million of millions; but no reader likes to stop and examine 000,000,000,000, when the words 'million of millions' would have done equally well.

The decimal system, made complete, supposes a point always to be placed at the end of the units, to separate them from the fractions which may follow. When there are no fractions, the point is useless, as in 675· or 675·000, which is 675. The numbers on the right of the point, successively denoting tenths, hundredths, thousandths, &c. of a unit [FRACTIONS], are in denominations which have not received distinct names. The modern French call them decimes, centimes, &c.; and the attempt has before now been made (see Wybard's 'Tactometria' 1650), to introduce centesms, millesms, &c. into English, but with no success.

The principle of *local value* [ARITHMETIC], which distinguishes our system of numeration from that of the Greeks and Romans, is applicable to any system, whether decimal or not. If 10 stand for *ten*, that is, if units in the second column are ten times in value those of the first column, nine numeral symbols besides the cipher are requisite; but if 10 had signified fifteen, it would have been necessary to have fourteen distinct symbols of number besides the cipher, since 10, 11, &c. now stand for sixteen, seventeen, &c. In such an explanation, the frame-work of our numerical language (being decimal) is not well calculated to give an easy comprehension of the change: we should rather invent a word for fifteen, or five and ten, say A; whence A-one, A-two, &c. would be the spoken sounds answering to what we now call sixteen, seventeen, &c.; while ten, eleven, twelve, thirteen, and fourteen would require new names not connected in etymology with *ten*.

The method of reducing a number, decimally expressed, to another in which the *radix* or base of the system (as ten is that of the common one), is *a*, is as follows: divide the number successively by *a*, expressed in the decimal system; the remainders give the units, *a*s, *aa*s, &c. of the new expression. Thus if 12376 is to be expressed in the *quinary* system, whose base is 5, we should have the following process:—

	Rem.	Number required, 344001.
5)12376		Decimal.
5)2475	1	$3 \times 5^5 = 9375$
5)495	0	$4 \times 5^4 = 2500$
5)99	0	$4 \times 5^3 = 500$
5)19	4	$1 = 1$
5)3	4	
0	3	12376

This exhibits both the reduction to the quinary system and the restitution of the decimal expression; but if the number had been given in the quinary system, it might have been reduced to the decimal system by the same rule, the new base ten being, in the old or quinary system, represented by 20, and the rule of division being performed by the use of five in the same manner as ten is used in the decimal system.

	Rem.	Number required, 12376.	
20)344001		Decimal.	Quinary.
20)14422	11 or 6	$1 \times (10)^4 =$	310000
20)443	12 or 7	$2 \times (10)^3 =$	31000
20)22	3	$3 \times (10)^2 =$	2200
20)1	2	$7 \times 10 =$	240
0	1	$6 =$	11
			344001

The quinary being supposed the old system, as soon as we come to the remainder 11, we have to invent a new symbol (say 6), since 11, in the *new* system, is to stand for eleven. For further examples, see the 'Library of Useful Knowledge: Treatise on the Study of Mathematics.'

In teaching the elements of numeration by the abacus [ABACUS], it is desirable that exercise should be given in several different systems, were it only to prevent the formation of that impression which so many students long retain, that the decimal system is natural and necessary. The want of words for the denominations will be the only difficulty; this may be got over by using the letters A, B, C, &c., to represent them. Thus if the system be quinary, A counts as one ball on the second row or five on the first, B as one ball on the third row, five on the second, or twenty-five on the first, and so on. All the balls on the second row may be marked A, those on the third B, &c.

NUMERATOR (or Numberer), the part of a fraction which states how many of the aliquot parts of a unit are taken, such as are described by the denominator. Thus $\frac{3}{7}$ being three, not of units, but of sevenths of a unit, 3 is the numerator.

NUMERIA'NUS, MARCUS AURELIUS, succeeded to the throne conjointly with his elder brother Carinus, after the death of their father, at the beginning of A.D. 284. Numerianus was with the army in Mesopotamia at the death of Probus; but instead of following up the advantages which his father had gained over the Persians, he was compelled by the army to abandon the conquests which had been already made, and to retreat to Syria. During the retreat a weakness of his eyes obliged him to confine himself to the darkness of a litter, which was strictly guarded by the Praetorians. All orders were issued by Arrius Aper, the prefect of the Praetorians, who was the father-in-law of the emperor. The absence however of Numerianus excited the suspicion of the soldiers; and when the army, after a march of eight months, arrived at Chalcedon on the Bosporus, they insisted upon seeing their prince, and accordingly burst into the imperial tent, where they only found the dead body of Numerianus. Suspicion naturally fell upon Arrius; and an assembly of the army was accordingly held for the purpose of avenging the death of Numerianus and electing a new emperor. Their choice

fell upon Diocletian, who immediately after his election put Arrius to death with his own hands, without giving him an opportunity of justifying himself, which might perhaps have proved dangerous to the new emperor.

The virtues of Numerianus are mentioned by most of his biographers. His manners were mild and affable; and he was celebrated among his contemporaries for his eloquence and poetry. He successfully contended with Nemesianus for the prize of poetry, and the senate voted to him a statue, with the inscription, to 'Numerianus Cæsar, the most powerful orator of his times.'

(Vopiscus, *Numerianus*, Aurelius Victor, *De Cæsaribus*, c. 38; Eutropius, ix. 12; Zonaras, book xii.)



Coin of Numerianus.
British Museum. Actual Size.

NUMERICAL, as opposed to literal, in algebra, applies to an expression in which the coefficients of a letter are all numbers, and not letters. As opposed to algebraical, it applies to the magnitude of a quantity, considered independently of its sign. Thus -7 is said to be numerically greater than -5, though algebraically less. [NOTHING.]

NUMESIA'NUS, or NOMISIANUS, a physician, born at Corinth, who deserves to be recorded as one of Galen's tutors (Galeni *Anatomic. Administrat.*, lib. i., cap. 1), who informs us in another place (*Comment. in Hippocr.*, libr. 'De Naturâ Hominis,' Comment. 2), that Pelops, another of his tutors, was also one of this physician's pupils. He lived in the second century after Christ.

NU'MIDA. [PAVONIDÆ.]

NUMI'DIA was originally bounded on the east by the dominions of Carthage; on the west by the Mulucha, or Molocath (Sallust, *Jug.*, 19, 92; Strabo, p. 827. Casaubon), the modern *Mulwia*, or *Mohalou;* on the north by the Mediterranean, and on the south by the Gætuli. The Roman province of Numidia was of much smaller extent, being bounded on the west by the Ampsagas (*Wadi-al-Kebir*), and on the east by the Tusca (*Zain*, Shaw), and thus corresponded to the eastern part of Algiers.

The Numidians were originally a nomade people, whence they were called by the Greeks Nomades (Νομάδες), and their country Nomadia (Νομαδία, Polyb., xxxvii. 3; compare Sallust, *Jug.*, 18; Plin., *Hist. Nat.*, v. 2). This name seems to have been originally applied not merely to the inhabitants of the country to which the name of Numidia was afterwards restricted, but to all the nomade tribes of northern Africa; thus Appian (*Bell. Civ.*, ii. 44) mentions the Maurusii (Mauri) as nomades. But when the Greek and Roman writers speak of the Numidians, the term is usually limited to the two great tribes of the Massæsylii and Massylii, the former of whom extended along the northern part of Africa from the Mulucha on the west to the Ampsagas on the east, and the latter from the Ampsagas to the territories of Carthage.

When the Romans first became acquainted with the Numidians, which was during the course of the second Punic war, Syphax was king of the Massæsylii and Gala king of the Massylii. Gala had a son of the name of Masinissa, who possessed extraordinary powers both of mind and body. He was brought up at Carthage, and was so highly esteemed by Adherbal, that he promised to the young Numidian his daughter Sophonisbe in marriage. Before the marriage took place, Masinissa accompanied Adherbal into Spain, where he served with great credit in the war against the Romans. But during his absence, the Carthaginians, without the consent of Adherbal, gave Sophonisbe in marriage to Syphax, in order to secure his co-operation against the Romans. (Appian, *Hist. Rom.*, viii. 10.) This induced Masinissa to make a secret alliance with Scipio in Spain; but the Carthaginians, having obtained information of his proceedings, used every means to ruin his power. His father Gala had died during his absence in Spain, and the government had been usurped by one Mezetulus, who received the support of the Carthaginians. Masinissa however, on his return to Numidia, defeated Mezetulus; but he had scarcely obtained possession of the government, before he was attacked by Syphax, and compelled to leave his kingdom and retire to the neighbourhood of the lesser Syrtis, where he remained with a small body of adherents till the arrival of Scipio in Africa. (Liv., xxix. 29-33.) He accompanied Scipio during the remainder of the war, and in many engagements rendered essential service to the Roman arms. It was principally owing to the courage of Masinissa that Adherbal and Syphax were defeated, and that the latter fell into the hands of Scipio (B.C. 203). On this occasion Masinissa obtained possession of Sophonisbe; but finding that his connection with her did not meet with the approval of Scipio, who feared lest the daughter of Adherbal might withdraw him from his alliance with the Romans, he is said to have sent poison to Sophonisbe, and recommended her to destroy herself.

The great services of Masinissa did not pass unrewarded by the Romans. At the conclusion of the second Punic war he obtained all the dominions of Syphax and a considerable part of the Carthaginian territory, so that his kingdom extended from the Mulucha on the west to the Cyrenaica on the east, and completely surrounded the small district which was left to the Carthaginians on the coast. (Appian, viii. 106.) Masinissa laid the foundations of a great and powerful state in Numidia. He introduced the arts of agriculture and civilised life, amassed considerable wealth, and supported a well appointed army. He died at the age of 90, B.C. 149. (Appian, viii. 106; Strabo, p. 833; Polyb., xxxvii. 3.)

Masinissa left three sons, Micipsa, Mastanabal, and Gulussa. The two latter died soon after the death of their father, but Micipsa lived to B.C. 118, and bequeathed the kingdom to his two sons Adherbal and Hiempsal and to his nephew Jugurtha, who was an illegitimate son of Mastanabal. Jugurtha however, not content with a divided sovereignty, murdered Hiempsal, and obliged Adherbal to fly to Rome, where he appealed to the senate against the usurpation of his cousin. Many of the senators however were bribed by Jugurtha, and a commission was sent to Africa in order to divide Numidia between Adherbal and Jugurtha. The commissioners awarded the better part of the country to Jugurtha; but scarcely had they left Africa, before he again attacked Adherbal, defeated him in battle, besieged him in Cirta, and having obliged him to surrender, put him to a cruel death. When this news reached Rome, war was declared against Jugurtha, which, after being carried on with various success, was at length terminated by the capture and death of Jugurtha B.C. 106. [JUGURTHA.]

After the death of Jugurtha, the kingdom of Numidia appears to have been given to Hiempsal II. (Hirtius, *Bell. Afr.*, 56), who was probably the nephew of Hiempsal the son of Micipsa. Hiempsal II. was succeeded, about B.C. 50, by his son Juba I., who took an active part in the civil wars against Cæsar. [JUBA.] On the death of Juba I., B.C. 46, Numidia was reduced to the form of a Roman province by Cæsar, who intrusted the government of it to the historian Sallust. (Dion Cassius, xliii. 9.)

The chief town in Numidia was Cirta (the modern Costantina, or Constantineh), which was the principal residence of Syphax, Masinissa, Micipsa, and Juba. [COSTANTINA.] Hippo Regius, the second town in the province, was situated near the coast about a mile and a half south of Bona. [BONA.] It was founded by the Phœnicians (Sallust, *Jug.*, 19), and is well known as the see of St. Augustin. It was called Hippo Regius to distinguish it from Hippo Zarytus in the province of Africa. It was a favourite place of residence with the Numidian kings. (Sil. Italic., iii. 259.) At the mouth of the Tusca was the small town of Tabraca, the name of which is still retained in the island of Tabarkah at the mouth of the river. South of Tabraca, probably on the Tusca, was the important town of Vaga, or Vacca (*Beja ?*), which is described by Sallust as the chief commercial town in Numidia. (Sallust, *Jug.*, 47.) South-west from Vacca was Tagaste, a free state according to Pliny (v. 4), and celebrated as the birth-place of St. Augustin.

The position of Zama, near which the memorable battle was fought between Scipio and Hannibal, B.C. 201, is uncertain. Some writers have considered it the same as the modern Zamorah, which is situated south-west of Setif; but others, with more probability, identify it with the modern Zainah, south-east of Setif. We learn from Livy that Zama was five days' journey from Carthage (Liv., xxx. 29), which distance would better agree with the position of Zainah

than with that of Zamorah. Zama was strongly fortified, and was occasionally the residence of the Numidian kings. (Sallust, *Jug.*, 56, 60, 61.) Juba fled to this town, after he had been defeated by Cæsar at Thapsus, but the inhabitants refused to admit him within the walls. (Hirtius, *Bell. Afr.*, 91.) Strabo relates that Zama was destroyed by the Romans (p. 829); but it is mentioned by Pliny (v. 4) as one of the free towns of the province; and the name of the bishop of Zama occurs in the councils of the African church.

An account of the principal places in the western part of the antient kingdom of Numidia, which was afterwards included in the province of Mauritania, is given under MAURITANIA. The physical features of the country are described under ALGIERS and COSTANTINA. The best account of Numidia is in Shaw's *Travels*.

NUMISMATICS, NUMISMATOGRA'PHIA, or NUMISMATOLOGY, the science of coins and medals. [COINS; MEDALS.]

NUMMULITE. [FORAMINIFERA.]

NUN. [MONACHISM.]

NUNCIO (*Nunzio*, in Italian; *Nuntius*, in Latin) signifies a messenger, but is used more particularly to designate the ambassadors sent by the pope to foreign courts. The nuncio is generally a prelate of the court of Rome; if a cardinal, he is styled 'legate.' Previous to the council of Trent, the papal nuncios in foreign countries acted as judges, in the first instance, of matters which were within ecclesiastical jurisdiction; but since that time they have acted as judges of appeal from the decisions of the respective bishops, in those countries only which are subject to the decretals and discipline of the council of Trent. In other kingdoms and states, such as France, Austria, Tuscany, &c., which, though Catholic, hold themselves independent of the court of Rome in matters of discipline, the nuncio has no jurisdiction whatever, and has merely a diplomatic character, like the minister of any other foreign power. (Père Richard, *Bibliothèque Sacrée*, art. 'Nonce.')

NUNCUPATIVE WILL. [WILL.]

NUÑEZ, or NO'NIUS, FERNAN, was of the house of Guzman. He is also called 'El Pinciano,' from Pintia Vaccæorum, the former name of Vallisoletum, now Valladolid, where he was born in the latter half of the fourteenth century. Although a knight of the military order of Sant' Iago, he devoted all his ardour to literary pursuits and the diffusion of learning through Spain, where he promoted the study of the Greek, after that of the Latin language had been rendered easy by Nebrisensis (Antonio Lebrija or Nebrija). Among the many eminent literary persons who followed Nebrija's steps, Pinciano stood conspicuous, even before he went to Italy to receive further instruction from Philippus Beroaldus and Govian, a celebrated Greek refugee. On his return to Spain, Nuñez brought back numerous Greek books with him; and Cardinal Cisneros, who admired his talents, appointed him and Demetrius the Cretan professors of Greek at his university of Alcalá, and moreover entrusted to him and to Lope de Astuñiga the Latin version of the 'Septuagint.' Endowed with a lofty spirit and a high patriotic feeling, which were fostered by the writings of antiquity which he expounded, he fought in 1521 with the unsuccessful Commons of Castile against the tyranny of Charles V., or rather his courtiers, a set of unprincipled foreign adventurers, who took advantage of the young prince's vanity and inexperience. Being obliged to leave Alcalá, he took refuge at Salamanca, in which university he taught Greek, Latin, rhetoric, and the natural history of Pliny.

He died in 1553, above the age of eighty, at Salamanca, and left to that famous seminary his select library. He wrote for himself the following epitaph:—'Maximum vitæ bonum mors!'

Among his other great qualities he had that of being very abstemious, but although he abstained from wine, he was fond of inviting his friends and pupils to his table.

Besides the share that he had in the 'Complutensian Polyglot,' Nuñez published 'Annotationes in Senecæ Philosophi Opera,' the text of which writer he restored; 'Observationes in Pomp. Melam;' 'Observat. in Hist. Nat. C. Plin.,' which have often been reprinted; 'Glosa sobre las Obras de Juan de Mena,' which is full of classical learning; 'Letters to Zurita;' 'Refranes y Proverbios Glosados,' which he left incomplete in the midst of his infirmities, a valuable book to the commentator of Cervantes, as Nuñez was well acquainted with Spanish proverbs, and skilful in applying them.

Gomez de Castro, or Gomecius, in his work 'De Rebus Gestis Fran. Ximen.,' Erasmus, Lucius Marinæus Siculus, Lipsius, Nicol. Antonius, Isaac Vossius, Mayans, Teissier, and others, expatiate on the high talents and virtues of Fernan Nuñez de Guzman.

This writer must not be confounded with *Alonso Lopez Pinciano*, Médico Cesáreo (physician to Charles V.), who attempted the epic in his 'El Pelayo,' and wrote in a series of letters the 'Philosophia Antigua Poética,' an extraordinary performance for the age, both as to substance and expression. It appeared at Madrid for the first time in 1596. This second Pinciano was the first modern scholar who ventured to think for himself on the subject of poetic art; he established a philosophical system, and went farther than his master Aristotle. By a careful and minute study of all the writings of that philosopher, he discovered that his 'Poetic' was but a fragment, for Aristotle refers repeatedly in his other works to a second part of the same 'Poetic,' which is lost; a fact which had escaped the notice of all previous commentators.

Pinciano endeavoured to restore dignity to poetry, and to develop its true character; he treats minutely of the senses, of the affections, the faculties of the understanding, and the pleasures of cultivated minds. He defines moreover poetical imitation more precisely than the Greek philosopher. His style however cannot now be considered as a model either of written or conversational language.

NUÑEZ, PEDRO. [VERNIER.]

NUREMBERG. [NÜRNBERG.]

NÜRNBERG, a very antient city of Bavaria, in the circle of the Rezat, and formerly one of the most flourishing members of the Hanseatic League, is situated in 49° 27′ N. lat. and 11° 4′ 15″ E. long. Nürnberg stands in an extensive and sandy but highly cultivated plain, 945 Paris feet above the level of the sea, on both banks of the river Pegnitz, which divides the city into two unequal parts: the smaller and northern is called the Sebaldus side, and the southern and larger the Lawrence side. The Pegnitz forms three islands within the walls, which are connected with each other and the city by seven stone and nine wooden bridges, and one suspension-bridge, which was commenced in 1824.

Though Nürnberg cannot be considered, properly speaking, as a fortified town, it is surrounded by an old wall, which has eight gates and a great number of round and square towers (Stein says 365, Hassel 119), and a moat nearly 200 feet broad. The circuit within the walls is three miles and a half, within which space there are many squares or markets, and gardens. The streets are in general broad and well paved, but crooked and irregular. The houses are very old-fashioned, retaining externally, with little alteration, the old Gothic style, and their internal arrangements recalling to mind the mode of private life of past ages. The fronts of the houses are often adorned with paintings: they are narrow, but often very deep, with a back front in a parallel street. One of the most remarkable antient buildings is the old fortress called the Reichsfeste, which was probably erected in the tenth century, under the emperor Conrad I., and the care of which was confided in the middle ages to the burggraves of Nürnberg, the ancestors of the house of Hohenzollern. This fortress stands on a pretty steep eminence, and the exterior, having received no modern additions, is an excellent specimen of the antient style. It contains a gallery of 549 pictures in 19 apartments, and many paintings on glass. The town-hall, one of the finest in Germany, is 275 feet wide, and contains, among other curiosities, a number of paintings by Albert Dürer, Hirschvogel, and others. Almost all the churches, 8 Lutheran, 1 Calvinist, and 1 Roman Catholic, are worthy of observation for their architecture and the works of art which they contain. That of St. Sebaldus contains the tomb of the saint adorned with fine statues of the twelve apostles, a noble altar, the celebrated crucifix by Veit Stoss, and painted-glass windows of extraordinary beauty. The church of St. Lawrence is a fine Gothic edifice, and is extremely rich in old German paintings. To each of these churches a Latin school is attached. The church of St. Ægidius, which was built in the Italian style at the beginning of the eighteenth century (1711-18), has a fine altar-piece by Vandyck. Near this church is the gymnasium, in front of which the city erected, in 1826, the statue of Melancthon, by whom

that institution was opened in 1526. The church of St. Clara has paintings on glass, of the year 1278. In that of the Holy Ghost the regalia of the empire were formerly kept, by order of the emperor Sigismund in 1424, and likewise many pretended relics of the Passion of our Saviour. The former Dominican church contains the city library of 20,000 volumes, with a collection of the works of Melancthon and of works written at the time of the Reformation. Nürnberg is remarkable for its numerous and well-conducted public institutions of every kind, such as the gymnasium, the Polytechnic Institution, a great number of schools for all classes; 15 free-schools, in which the children are supplied with books, clothing, and bread gratis; a seminary for teachers; a society for the promotion of manufactures, which has founded a school of industry for above 300 girls, and a Sunday drawing-school for the sons of mechanics, in which there are nearly 400 pupils; a Bible Society, and a great many collections, both public and private, of works of art, antiquities, &c.

Before the trade with the East Indies took a new direction, after Vasco de Gama had doubled the Cape of Good Hope, Nürnberg was one of the most important commercial cities in Europe. It forwarded to the North the rich productions of India, which it received from Italy; nor was this the only source of its prosperity. The residence of the burggraves (from the year 1060) and occasionally that of the emperors was a great advantage, and, above all, its manufactures brought a great influx of wealth. Nürnberg was celebrated four hundred years ago for working in brass, iron, and other metals, and for the manufacture of a long list of articles comprised under the general denomination of Nürnberg wares, musical and mathematical instruments, hardware, and toys of all kinds, both of metal and wood. Public and private wealth accumulated, and not only the useful but the fine arts flourished; so that the history of the arts in Nürnberg is a very important part of that of the fine arts in general, especially of painting and engraving. The altered course of the East India trade, the attention of other states to the advantages of commerce, the ravages of the Thirty Years' War, dissensions between the nobility and the citizens, and an increasing load of debt, caused Nürnberg gradually to decline. Yet its trade is still considerable, especially in articles of its own manufacture in iron, steel, and brass; and in hardware of all kinds, turnery, looking-glasses, musical instruments, paper, engravings, painters' colours and pencils, glass, porcelain, watches, calicoes, carpets, and other articles too numerous to mention. The extraordinary cheapness of the Nürnberg toys, most of which are however made by the country-people in the hilly and wooded tract between Franconia and Thuringia, causes the trade in them to be very extensive and important. There is now an annual fair, at which a great deal of business is done.

Nürnberg is first mentioned in history in 1050, and obtained its first charter in 1219. As a free city of the circle of Franconia, celebrated for its industry and commerce, and for great services to the emperor and the empire, it retained its freedom among all the changes made in Germany in 1803. It had a territory, for the most part well cultivated, nearly 500 square miles in extent, with 40,000 inhabitants, and a revenue of 800,000 florins; but the public debt amounting, in 1797, to nine millions of florins, the revenue was not sufficient to pay the interest. The differences with the king of Prussia, who took possession of part of its territory, necessarily increased its difficulties, till the Act of the Confederation of the Rhine assigned over its territory to the king of Bavaria, a decision which was by no means agreeable to the inhabitants. The population of Nürnberg, including the suburbs and the territory, was officially stated to be, in 1826, 39,626, of whom 3200 formed the garrison. The latest accounts we have seen (1838) make the population 41,000, of whom about 3500 are Roman Catholics, and the great majority Lutherans.

The great painter Albert Durer was a native of Nürnberg, and also Melchior Pfinzing and Hans Sach, the poets, and Martin Behem, who made the first serviceable terrestrial globe. Among the numerous inventions for which the world is indebted to Nürnberg are watches (first called Nürnberg eggs) by Peter Hele, the pedal by Heinric Traxdorf, the air-gun by Lobsinger, the clarionet by C. Denner, brass by Erasmus Ebner, the lock for fire-arms by a person not known, and many others.

(The descriptions of Nürnberg and of the public edifices are very numerous: among them are the 'Nürnbergisches Taschenbuch,' 1822; the 'Nürnberger Jahrbücher,' Hagen's 'Norica,' &c.)

NUT. [FILBERT.]

NUTATION. [PRECESSION AND NUTATION.]

NUTCRACKER, the name of an Insessorial bird, rarely seen in Britain, and whose place in the system it is rather difficult to fix. Some of its habits, and the worn appearance of the tail-feathers from climbing about the branches of trees, together with the nesting in hollows of trees, indicate a relationship to the *Picidæ*. Its manners, which are said to resemble those of the *Jay*, and other circumstances connected with its food and organization, bring it into alliance with the *Crows*, to which family it is generally referred by ornithologists, and so placed as to approximate either to the *Woodpeckers* or *Starlings*. Mr. Vigors considers it as assimilating to the latter family, and especially to the genera *Cassicus* and *Barita*. Mr. Swainson makes it a subgenus of *Corvus* in his subfamily *Corvinæ*, placing it immediately after the subgenus *Pica*, and immediately before the genus *Barita*. The Prince of Musignano arranges it also under the subfamily *Corvinæ*, among which it occupies the last place in his 'Geographical and Comparative List,' whilst it immediately precedes the subfamily *Sturninæ*. Mr. Yarrell (*British Birds*) places it at the end of the *Crows*, and immediately before the Woodpeckers. Sir W. Jardine (*British Birds*) arranges the genus between the *Magpie* and the *Jay*. In Temminck's arrangement its place is between the *Jays* and the *Choughs* (*Pyrrhocorax*).

Nucifraga.

Generic Character.—*Bill* conical, longer than the head, straight, the upper mandible having the culmen rounded, overhanging the lower, both terminating in an obtuse and depressed point. *Nostrils* basal, round, open, concealed by hairs directed forwards. *Toes*, three before and one behind, the two outer being united at their base. *Tarsus* longer than the middle toe. *Wings* long and pointed, the first quill shortest, the fourth and fifth longest. (Gould.)

This genus is generally considered to comprehend only two known species:—the bird whose English name heads this article, and *Nucifraga hemispila*, which bears a considerable resemblance to it, though it is clearly a distinct species, described and figured in Mr Gould's 'Century of Birds,' from the Himalaya mountains. The student should however bear in mind that the Prince of Musignano and Mr. Audubon, both high authorities, the former from his extensive and accurate knowledge of genera and species, and the latter from the great attention which he has paid to the habits of the birds of America, include the *Corvus Columbianus* of Wilson in the genus *Nucifraga*.

We select as an example the European species, *Nucifraga Caryocatactes*.

Description.—Size about that of the *Jackdaw*, but the tail is longer. Plumage reddish umber-brown; the body, with the exception of the head and rump, dappled with large white spots which occupy the centre of each feather wings and tail blackish, shot with green; the feathers of the latter (except the two middle ones) tipped with white. Bill and legs brownish black. Sexes, as in the crows generally, nearly alike. The female is, if anything, a little smaller and her plumage less lively.

This is the *Corvus Caryocatactes* of Linnæus; *Caryocatactes* of Willughby; *Casse Noix* of the French; *Ghiandaia Nucifraga* of *Stor. degl. Ucc.*; *Nocciolaja* of Savi; *Kurz und Langschnäbliger Nussknacker* of Brehm; *Tannen Heher* (Pine Jay) oder *Türkischer Holzschreyer* of Frisch; *Notwecka, Notkraka*, of the Swedes; *Noddekrige* of the Norwegians; *Notkraake* of Brunnich; *Nussrabbe* of Meyer; and *Aderyn y cnau* of the antient British.

Habits, Food, Reproduction, &c.—The manners of the Nutcracker are said, by those who have observed it, to resemble in some degree those of the Jay, and some of its habits those of the Woodpeckers. Like the former it feeds on nuts and berries, as well as on the seeds of the pine, of which it appears to be very fond; and, like the latter, it climbs the trunks and branches of trees, tapping the bark with its bill to start the insects and their larvæ that may lurk beneath, and devour them. They are said to crack nuts much in the same way with the *Nuthatch*. The nest is formed in the hollows of trees, which the bird is supposed to enlarge after the manner of the woodpeckers. The eggs are five or six in number, of a yellowish white or grey, with

a few spots of bright grey brown. Temminck states that it sometimes devours young birds and eggs.

Geographical Distribution.—Central Europe. The bird is a rare visitant to Great Britain, and does not appear to have been seen in Ireland. The only one Pennant ever heard of was killed near Mostyn in Flintshire. Montagu mentions one that was killed in Kent, and states that one was seen by an accurate observer near Bridgewater. He also notices two others, which were shot in 1808, one in Devon, the other in Cornwall. Mr. Selby mentions one that was seen in Netherwitton Wood in Northumberland. Mr. Rodd, of Penzance, gave Mr. Yarrell information of one that was seen on a tree on the banks of Hooe Lake. It is recorded by Dr. Moore as having been shot in Devonshire near Washford Pyne Moor. Another is said to have been lately noticed at Peppers Harrow Park, lord Middleton's seat. Mr. Macgillivray gives instances of its having been shot in Scotland.

Temminck records varieties of pure white, or yellowish white, with deeper spots; sometimes with the wings and tail white.



The Nutcracker.

NUTHATCH, the vernacular name for a Scansorial British bird, with much of the habits of the Woodpeckers, and which may be taken as an apt illustration of the genus *Sitta* of Linnæus.

Mr. Swainson places the genus in the subfamily *Sittinæ*, being the second of his family *Certhiadæ*. The Prince of Musignano makes it the first subfamily of that family.

Generic Character.—*Bill* straight, cylindrical, slightly compressed, subulated, accuminated. *Tongue* short, horny, and armed at the point. *Nostrils* basal and rounded, partly hidden by reflected bristles. *Feet* with three toes before and one behind, the outer toe being joined at its base to the middle one; hind toe of the same length as or longer than the middle one, with a long and hooked claw. *Tail* of twelve feathers. *Wings* rather short; the first quill very short, the third and fourth the longest. (Gould.)

Example, *Sitta Europæa*, the *Common Nuthatch*, or *Nutjobber*.

Description.—Plumage above fine blue grey; quills and base of tail-feathers, except the two middle ones, black, the outer tail-feather on each side with a black spot near the tip. A black band passes from the bill through the eye down the sides of the neck, ending abruptly near the shoulders; throat whitish; rest of plumage below rufous brown blending into chesnut on the flanks; bill and feet black; iris hazel. Sexes alike.

This is in all probability the Sitte (Σίττη) of the Greeks, and *Sitta* of the Latins. It is the *Ziolo*, *Picchio grigio*, *Raparino*, and *Picchio formicajo* of the Italians; *Muratore* of Savi; *Torchepot* and *Pic-maçon* of the French; *Kleiber* and *Blauspecht* of the Germans; *Notwacka* and *Notpucka* of the Swedes; *Spætt-meise* of the Danes; *Nöt-Bake* of Brunnich; *Klener*, *Nusszhacker*, of Kramer; and *Delor y cnau* of the antient British.

Habits, Food, Reproduction, &c.—Like the Woodpeckers and Creepers, the Nuthatch runs with facility upon and about the trunks and branches of trees; but the tail, which is short and rounded, is of no assistance to the bird in its progress. Unlike the Woodpeckers however, the Nuthatch runs with the head downwards as well as upwards, and indeed the former position of the head appears to be the favourite one; it generally alights on a branch with the head in the downward position, and sleeps in that posture. It is almost constantly in motion. Its food consists of insects and their larvæ, berries, and nuts. The latter it fixes in some chink, and cracks them by repeated strokes of the bill. 'It is a pretty spectacle,' says Willughby, 'to see her fetch a nut out of her hoard, place it fast in a chink, and then, standing above it, with its head downwards, striking it with all its force, break the shell and catch up the kernel.' The same author found beetles in the muscular stomach or gizzard of one opened by him. The filberd gives the Nuthatch but comparatively little trouble; but the more dense hazel-nut calls forth greater energies, and when employed upon one of those nuts, the bird makes the neighbourhood resound with the strokes of its bill. Its call-note in the spring is a clear shrill whistle. The nest is generally made with only a few dry leaves in the hole of a tree, and the eggs, which are from five to seven in number, are of grey-white spotted with reddish brown. If the hole selected be too large, the bird plasters up a part of it with mud, and will renew the plaster if destroyed, whence one of its French names.

The female, when surprised on the eggs or her young, makes a most determined defence with bill and wings, hissing at the intruder violently at the same time. It seems indeed to be a very attached bird. The old French quatrain says—

'Le Torchepot et sa femelle ensemble
Vivent en paix tout le long de l'Esté.
Parquoy l'on dit, que qui est arresté
A son mesnage au Torchepot ressemble.'

Of its bravery and courage when made captive, a painful story is told in the 'Magazine of Natural History.' A Nuthatch had been winged by a sportsman, and was put into a small cage made of oak and wire. During a night and day, the period of his confinement, his tapping labour was incessant, and at the end of that time the wood-work of his prison was pierced and worn like worm-eaten timber. His impatience of his situation was excessive; his efforts to escape were unremitted, and displayed much cunning and intelligence. He was fierce and fearlessly familiar, and voraciously devoured the food placed before him. His hammering is described as having been peculiarly laborious, for he did not peck as other birds do, but taking a firm grasp with his great feet, he turned upon them as upon a pivot, striking with his whole weight, and thus assuming with his body the appearance of the head of a hammer in motion. This unfortunate bird sank at the close of the second day under the combined effects of his vexation,



Common Nuthatch.

assiduity, and voracity. The Rev. T. L. Bree mentions one which he caught in a common brick trap: when the bird was found, the bill appeared to be truncated, and he inferred that it had been fairly ground down to about two-thirds of its original length by the pecking of the bird at the bricks in its efforts to escape.

Geographical Distribution.—Europe generally. Temminck notes its range as extending far to the north and south, and as rather abundant in central Europe. Mr. Selby traced it in Britain as far north as the banks of the Wear and Tyne; and it is noted in Mr. Thompson's Irish list.

Mr. Gould describes and figures two other species, *Sittæ rupestris* and *Asiatica*, in his 'Birds of Europe.'

The genus is found in India and America; and there are closely allied forms in the Indian Archipelago and in New Holland.

NUTMEG. [MYRISTICA.]

NUTRITION. One of the chief differences between inorganic and organic bodies is, that the former retain their form and other characters by a passive resistance to change; the latter by a constant change of their particles, in which those that in the constant actions of life or by the influence of external agents have been destroyed, are replaced by others similar to themselves. This constant change is effected by the process of nutrition. Nutrition is the last step of the general process of assimilation, by which living bodies convert the materials which they derive from their food into substances like their own, and appropriate the materials thus changed to their own increase or repair. The several nutritive matters received into the living body are variously altered by digestion, absorption, respiration, and by all the other changes which the blood or other fluid undergoes in its passage to the several parts of the frame; these changes constitute the process of assimilation, at the end of which each part of the body abstracts from the general and homogeneous mass of nutritive fluid that which is required for its own growth or repair; muscle abstracting particles to form muscle, nerves from the same fluid abstracting particles to form nerve, and so on.

That a constant change of particles goes on in the majority of the tissues of the living body may be considered certain. It is evidently necessary from the nature of the case; for the living body is exposed to the same external agents as inorganic matter is, and all its own actions are so many more sources of waste to each tissue. Some constant power of repair must therefore be requisite to maintain living bodies in a state of integrity against these constant sources of waste; and that power is exerted in nutrition. Its influence is shown in the fact, that the living body retains throughout life, or a great portion of it, its form and composition less altered than the most solid of inorganic matters exposed to similar influences. Within certain limits also, the greater the waste, the greater the nutritive supply: thus, for example, by constant exercise the size of the muscles, so far from being decreased, is ultimately increased, the effect of nutrition being not only to replace that which was destroyed, but to supply a certain quantity more. We may clearly observe an application of the same law in the cuticle; that in the palm of the hand is more than twice as thick as that on the back of the arm, yet the former is subject to the most friction; and if the friction of the palm be greatly increased, the cuticle, notwithstanding the greater waste, increases in thickness in a yet greater proportion, so as to defend the subjacent skin from the greater source of injury to which it is exposed.

It is true that when the body does not change in any of its sensible qualities, we cannot be so well assured of any change of particles still going on; but we may reasonably assume that the two parts of nutrition, the removal of old and addition of new particles, which at other times we trace producing either an increase or decrease of the body, as one or the other of them predominates, are exactly balanced. If we examine, for example, the growth of any hollow organ of the body, as the heart, we find that in advancing years from childhood to manhood, it increases not only in its whole bulk, but also in the size of its cavities, and that, at every period of life, the size of the cavities and the thickness of their walls bear nearly the same proportion. Now, if only an addition were made to the exterior of the heart of a child, its whole bulk would be increased, but the size of its cavities would be disproportionately small. We must therefore assume that substance is removed from the interior of the heart, at the same time, though not in exactly the same quantity, that substance is added to its exterior. In like manner, when the heart diminishes in size, as it usually does in persons labouring under consumption, material must be at the same time abstracted from the exterior, and, in rather a less proportion, added to the interior. Whatever of this kind is true of the larger organs must be equally so of the small ones; so long as they preserve the same form and proportions, no change of size can take place without the concurrence of the two processes of nutritive deposition and absorption; when the former preponderates, the part will increase in size—when the latter preponderates, it will diminish; the former, when connected with disease, is named Hypertrophy [HYPERTROPHY], the latter Atrophy. [ATROPHY.]

The coincidence of these two processes, where any change of size takes place, being thus proved, and their continuance, when no such visible change occurs, being necessary, we may fairly assume that in the latter case, in the state of nutritive equilibrium, they still continue, though their opposite effects being exactly balanced, the ultimate result is not discernible. Popular belief, adopting this idea as one of whose truth there could be no possible doubt, has even assigned the periods of time in which one whole set of particles is removed and replaced. There is no evidence whatever upon which any such calculation can be made; the period in which an entire change is completed probably varies greatly in different tissues and different external circumstances, and in the bones and teeth it is probable that the particles once deposited are never removed, so long as the animal's size and other characters remain unaltered.

The process of nutrition is concerned in the production of two apparently different results—that of development and that of growth. In development the added particles not merely increase the size of the part, but produce a change in its form or its substance. Thus, the whole body, with all its varieties of tissues, and through all its changes of form, is *developed* by nutrition, from a small part of a little sac [FŒTUS], which, to all appearance, is composed of homogeneous materials. In *growth* each part increases by the predominant deposition of particles within and around those of which it was previously composed, and similar to them. These two nutritive processes, though in the period of life previous to the adult age they are usually concurrent, may go on independently of each other. Thus the body may be deficient in development, some part of it being monstrous, that is, remaining of the same form as that which it had in the embryonic state [MONSTER], and yet with this defect in form it may increase in size, for monsters are commonly well-grown; and, on the other hand, being perfect in development and form, the body, or some part of it, may be deficient in size. A dwarf is an example of a defect of growth; a hare-lip, a cleft palate, an anormal unossified cartilage, are examples of defects of development: both are defects in the process of nutrition, but the failure is in each in a different direction.

One of the most important facts regarding the process of nutrition is that lately discovered by Dr. Schwann of Berlin (*Mikrosk. Untersuch. über die Uebereinstimmung der Thiere und Pflanzen*), that all the tissues of the body, however different in their fully developed state, yet originate from the same fundamental forms, and up to a certain period of their development pass through the same series of changes. He has shown that the law of development from cells, which Schleiden had proved to obtain in the formation of all vegetable tissues (*Beiträge zur Phytogenesis*, Müll. Arch., 1838), holds with equal truth in all the animal tissues, and thus that in their first periods of existence all organised structures follow the same laws of formation. The great principle of formation is briefly this:—from a living but amorphous substance, to which the name of cytoblastema is given, minute roundish corpuscles first form. Around each of these a layer of organic substance, being after a time deposited and becoming membranous, forms a spherical or elliptical cell enclosing the corpuscle in or upon its wall. Around or rather upon this cell, a second cell next forms in the same manner as the first had, and to a part of its walls the first cell remains attached, and forms what is named the nucleus of the cell. These cells, containing nuclei, which again enclose one or more corpuscles, may be regarded as the original forms of which all the solid parts of the body are composed, or from which, altered according to various but certain laws, they are all produced. As ex-

amples of such primary cells in their simplest form and separate, we find in the animal body the blood-globules, which float in a quantity of fluid cytoblastema. Nearly similar cells with nuclei are found, forming membranes, with scarcely any intervening substance, in the horny tissues, as the cuticle, nails, feathers, &c., in which moreover each cell presents evidence of vitality to a certain degree independent of the rest of the body, inasmuch as they undergo various changes of form, flattening, enlarging, and splitting into fibres, after their first formation. In the next stage, the cells are separated by a larger quantity of intervening substance, with which their walls become amalgamated, as in the cartilages, bones, and teeth, in which such primary cells constitute the peculiar corpuscles by which those tissues have been long distinguished, and the intervening substance, which forms the greater part of the tissue, is analogous to the soft or fluid cytoblastema of other parts. In these tissues also, the cells begin to acquire some peculiarities of form, sending out branched canals from their sides in a star-like manner, and becoming elongated. In the next degree similar cells, existing in the early periods of the tissue, acquire in the course of its development more peculiar forms, lengthening into the form of fibres and then splitting up into bundles of filaments, so as to form the fasciculi of cellular tissue, tendons, and elastic tissue, which remain connected by a very small quantity of the amorphous cytoblastema. Lastly, instead of each cell lengthening and splitting into fibres, we find a number of cells arranging themselves in rows and adhering together, till, by the absorption of their attached membranous walls, their cavities open into each other and form a continuous hollow tube. Thus they form a kind of elongated secondary cell, which, continuing to grow in length and having peculiar substances deposited in its interior, acquires the characters of the fibres of peculiar tissues, as of the muscles or the nerves. In other cases each cell elongates and branches, and becomes connected with others which like it retain their cavities, so as to form together a series of tubes in the form of a network, which thus make up the capillary blood-vessels.

Each tissue thus formed from a series of cells increases in size, either by the increase of its primary cells or the elementary forms developed from them, by the interstitial deposition of particles within their tissue or in their cavities, or it grows by the formation of new cells within the tissue interposed between those previously existing, or (though very rarely in the animal body) by the development of young cells within the older ones.

The material of nutrition is in animals obtained from the arterial blood, which is constantly sent in the vessels distributed amongst or near the elementary structures of each tissue; but the proper act of nutrition is performed not by the power of the blood-vessels, as has been commonly supposed, but by the cells and the structures analogous to them, which convert the common nutritive matter drawn from the blood into their own proper tissue. The blood-vessels are only the conveyers of the materials for nutrition, and the difference commonly made between growth by intussusception, or deposition within the tissue of a part, and growth by apposition, or deposition on the surface of a part, is more apparent than real. The parts that are said to grow by apposition are those in which vessels do not run through the very substance of the tissue, but only on one side of it, as the cuticle, the vessels for the nutrition of which run in the subjacent skin. In these the formation of cells from the nutritive matter poured out from the blood-vessels can only take place on the surface of the skin, though they may undergo various changes when removed to a short distance by fresh depositions beneath them. In vascular parts, on the other hand, the nutritive matter is effused in all the interstices of the net-work of their blood-vessels, and therefore in all parts of the interior of the tissue; but here also the development of the nutritive matter must take place in layers concentric with the blood-vessel from which it was poured out, and therefore by *apposition*, though, with reference to the mass of the organ or tissue, it seems to be a growth by intussusception. The formation of fresh cells is therefore always by apposition on those already existing; but the cells and the elementary tissues immediately developed from them increase by intussusception, that is, by particles being deposited in the interspaces of those already existing, or in the cavities which the membranes of the cells already formed surround.

Thus the process of organic nutrition is widely different from that by which inorganic masses increase in size, as in crystallization, which, as in it alone inorganic matter acquires definite form as it increases, can alone be compared with organic growth. In crystallization the addition of similar particles is entirely by external apposition, and the crystal has no power of attracting the particles of any matter different from its own: organic particles (as cells), on the contrary, not only attract particles into their interior spaces, but alter them on their passage, decomposing them from their previous elementary composition, and recombining them into matter like their own.

In healthy nutrition each part appropriates particles similar to its own, or differing according to certain laws of development; in disease, parts frequently appropriate other substances than their own, and all the solid products of various diseases may be regarded as the effects of morbid processes of nutrition. Some of these are formed according to the laws of normal development, and are only morbid because out of place, as cicatrices, adhesions, and the other similar products of simple inflammation; others are produced by the deposition of substances different from any of those already existing in the body, as in the production of various tumours. The former are composed of a tissue similar to cellular tissue, but the injuries of parts are but partially repaired by it, because the new tissue, which is in all cases nearly the same, differs in many of its characters from that which it replaces.

The most complete exercise of the process of nutrition in repairing injuries, whether from accident or disease, is exhibited in the regeneration of parts, but in man and the higher animals there are but few examples of a perfect reproduction of the injured or destroyed tissue. The bones and the non-vascular tissues are probably the only instances in which a tissue destroyed by disease or internal injury is replaced by one similar to itself.

In all these cases of repair or regeneration of tissue, the same process of the effusion of nutritive matter and the several stages of formation and alteration of the cells, is gone through which is observed in the first development of the tissues. But the process fails before the higher changes are accomplished, and the repairing tissue acquires only a low degree of development. As far also as they have been at present examined, the various morbid growths appear to be formed on a similar plan, and to proceed from a formation of primary cells.

NUTTALITE, a mineral which occurs crystallized. Primary form a square prism. Cleavage parallel to the lateral planes. Fracture uneven. Hardness 4·0 to 4·5. Colour grey. Lustre vitreous. Translucent. Specific gravity 2·7 to 2·8.

It is found at Bolton in Massachusetts imbedded in calcareous spar. Analysis by Thomson—

Silica	37·81
Alumina	25·10
Lime	18·33
Potash	7·30
Protoxide of Iron	7·89
Water	1·50
	97·93

NUWAYRI is the patronymic of a celebrated Arabian historian of the eighth century of the Hejira, whose complete name was Ahmed Ibn Abd-al-wahhab Al-bekri Al-teymi Al-kindi, and who was further distinguished by the honourable surname of *Shehabu-d-din* (bright star of religion). He was born at Nuwayreh, a small town of the province of Bahnasa in Egypt, in the year 682 of the Hejira (A.D. 1283-4). Nuwayri distinguished himself as a theologian of the sect of Shafei, and also as a rhetorician and grammarian, and he wrote several works on these subjects, the titles of which have not reached us. But the work which has made Nuwayri known among European scholars is his 'Nehayetu-l-arab fi fanni-l-adab.' It is a sort of cyclopædia, consisting of thirty books or volumes, and divided into five *fann* (subjects), each of which is further subdivided into *kasm* (sections), containing each a certain number of *bab* (chapters). The first four *fann* treat of the physical sciences and the several branches of natural history and moral philosophy. The fifth and last, which is likewise the most valuable for Europeans, is wholly occupied with a history of the Mohammedan settlements both in the east and west. The sixth *bab* (chapter) of the same contains a

narrative of the conquest of Africa, Spain, and Sicily by the Saracens, together with a chronological history of the sultans of the family of Umeyyah, who filled the throne of Cordova from A.H. 138 to 428 (A.D. 755 to 1036), and a short account of the principal events of their reigns.

Nuwayri died, according to Haji Khalfah, in the year 732 of the Hejira, at the age of 50. Among his other accomplishments his biographers say that his hand-writing was very fine; indeed he seems to have made a trade of it, for Soyútti, in his 'History of Egypt' (Ar. MS. in the Brit. Mus., 7331, f. 127), says that he made eight transcripts of the large collection of Mohammedan traditions, by Bokhari, entitled 'Sahih,' for each of which he was paid the enormous sum of one thousand dirhems, or about sixty-five pounds sterling. He dedicated his large work to Almalek An-nasser Kalaün, sultan of Egypt (reigned from A.H. 678 to 689), a liberal patron of letters, by whom he was munificently rewarded.

Complete copies of Nuwayri's work are exceedingly scarce. We are however assured that it is entire in the library of the university of Leyden. The Escurial library possesses one volume, containing parts xi. and xii. (*Catal.*, No. 1637.) There are also several loose volumes at Paris belonging to different sets, and among them one supposed to have been written by Nuwayri himself. (*Bib. Reg. Pari. Cat.*, No. 702.)

Various extracts from the work of Nuwayri have been published at different periods. Reiske was the first who mentioned the work, in his 'Prodigmata ad Hagi Khalifæ Tabulas,' Leyden, 1766. Albert Schultens next gave a slight notice of the historical part of his work, together with a few extracts from it, at the end of his 'Monumenta Vetustiora Arabum,' published at Leyden, in 1740. Again, in 1786, Reiske made use of it for his 'Historical Notes,' published as a continuation to his translation of Abú-l-fedá (Hafniæ, 1789-94). Schultens published also a Latin translation of some fragments of Nuwayri in the collection entitled 'Historia Vetustissimi Imperii Joctanidarum in Arabia Felice.' That chapter of the fifth *fenn* which treats of the conquest of Sicily by the Mohammedans was next translated, first into Latin, by Rosario Gregorio, and printed in folio at Palermo, 1790, and inserted in the collection entitled 'Rerum Arabicarum quæ ad Historiam Siculam spectant, amplissima collectio,' and then into French, by Mr. J. J. A. Caussin; and Mr. James Lassen Rasmussen has lately published, in his 'Additamenta ad Historiam Arabum ante Islamismum,' Copenh., 1821, some fragments of the same work, in Arabic and Latin, respecting some curious customs of the Arabs who preceded Mohammed.

Notwithstanding all this, Nuwayri's work is still imperfectly known, and it is to be regretted that the historical part—at least that concerning the settlements of the Arabs on the continent of Europe—has not been published entire, as it would throw great light on the history of the middle ages.

Haji Khalfah's *Kashfu-dh-dhanún*, a bibliographical dictionary, in the British Museum; At-soyútti's *History of Egypt*, ib.; *Bib. Rich.*, No. 7331, fol. 70, v. *et passim.*

NUX VO'MICA. [STRYCHNOS.]

NYCTALO'PIA. [HEMERALOPIA.]

NY'CTERIS. [CHEIROPTERA, vol. vii., p. 24.]

NYCTHE'MERUS. [PAVONIDÆ.]

NY'CTIA. [OWLS.]

NYCTI'BIUS, M. Vieillot's name for a genus of birds, the type of which is the *Great Ibijau*, the *Grand Crapaud volant de Cayenne* of Buffon, *Caprimulgus grandis* of Latham.

Generic Character.—Bill very much depressed and dilated, especially at the base, where it is furnished with bristles, narrowed and hooked at the point; upper mandible with an obtuse tooth on each edge, towards its origin, very much developed in the old bird; lower mandible larger, with the edges curved outwards; gape very wide, reaching to the eyes; anterior toes united at the origin by a small membrane; lateral toes unequal; hallux robust and flattened. First quill shorter than the fifth.

Description of the Great Ibijau.—Size about that of a stout owl; total length of the bird rather more than twelve inches; of the bill, taken from the corners of the mouth, rather more than three; tail a little graduated, and exceeded by the wings when folded by a few lines; plumage brown, speckled with black, fulvous, and white, principally upon the back, wings, and tail; breast of a deeper brown than the spots; head, neck, and lower part of the body striped transversely with the same colours. In some individuals the plumage is more brown than it is in others.

Habits, solitary. The bird haunts hollow trees, and prefers those which are near the water. [NIGHT-JARS.]



Nyctibius grandis.

NYCTICE'BUS. [SLOW LEMUR.]

NYCTI'CORAX, Mr. Stephens's name for a genus of *Grallatores*, or *Wading Birds*, belonging to the family *Ardeadæ* (Herons and Cranes). Mr. Swainson has changed the name to *Nyctiardea*; but besides the inconvenience arising from the change, the generic name *Nyctiardea* is a hybrid word derived from Greek and Latin roots, and therefore objectionable.

Generic Character.—*Bill* very strong, rather longer than the head, compressed; upper mandible curved towards the point; maxilla sulcated for three-fourths of its length and emarginated; culmen rounded; tomia of both mandibles straight and sharp, that of the under mandible entering within the upper one. *Nostrils* basal, longitudinal, placed in the furrow of the maxilla, and covered above by a naked membrane; lores and orbits naked. *Legs* of mean length, slender. *Toes* three before and one behind; middle toe shorter than the tarsus, exterior toe connected by a membrane to the middle one as far as the first joint. *Claws* short, falcated, that of the middle toe pectinated. *Tibiæ* naked for a short space above the tarsal joint. (Gould.)

This form, of which at least seven species are now known, is widely diffused. Species occur in Europe, Asia, Africa, and America; and have been found in Manilla, New South Wales, and Tierra del Fuego.

We select as our example *Nycticorax Europæus*, Stephens; *Nycticorax Gardeni* Jard.; *Ardea Nycticorax*, Linn.

Description.—*Old Birds*—no difference in that stage of life between the sexes. Top of the head, back and scapulars, black with bluish and greenish reflections; three white very narrow feathers, six or seven inches in length, taking their origin at the back of the head just above the nape, and descending backwards; lower part of the back, wings, and tail clear ash-colour; forehead, space above the eyes, throat, front of the neck, and lower parts white; bill

black, yellowish at the base of the lower mandible; iris red; feet yellowish green; length rather more than 1 foot 8 inches.

Young of the Year.—The three long nuchal feathers absent; top of the head, nape, back, and scapulars of a muddy brown, with longitudinal bright red dashes on the centre of each feather; throat white, with small brown spots; feathers of the front and sides of the neck yellowish, with wide brown borders; coverts of the wings and quills ashy-brown, marked with great yellowish white spots at the extremity of each feather; lower parts clouded with brown, white, and ash-colour; middle of the belly whitish; *arête* and point of the bill brown, the rest greenish yellow; iris brown; feet olive brown.

In this stage it is the *Ardea maculata*, and *Ardea Gardeni*, Gmel.; *Le Pouacre* and *Le Pouacre de Cayenne*, Buff.; *Spotted* and *Gardenian Heron*, Lath.; and *Scarza cenerino*, 'Stor. degl. Uc.' Indeed ornithologists have described it as a distinct species, in almost every progressive stage of plumage.

In the old state the bird is the *Bihoureau*, *Roupeau*, and *Heron gris* of the French; *Scarza Nitticora* of the Italians; *Der Nacht-Reiher* and *Aschgraue Reiger mit 3-nacken federn* of the Germans; *Blaauwekwak* of the Netherlanders; *Night-Heron* and *Lesser Ash coloured Heron* of the British.

Habits, Food, Reproduction, &c.—The *Common Night-Heron* appears to affect high situations by day, and in the evening resorts to the low-lands, marsh, or river side for its food, which consists of fish, for choice, and in their absence of frogs, mice, and even insects. The old French quatrain says:—

'Le Bihoureau espece de Heron
Es haults rochers et es collines haute.
Sa forme est pe[illegible]au Heron differente,
Sus le rivage il vit, et environ.'

The general truth of this picture of its habits is borne out by modern observation; and its fondness for perching on high situations is attested by Mr. Gould, who received a fine adult specimen which had been shot from a high tree in the gardens at Frogmore near Windsor. The nest is built of sticks on the topmost branches of trees, and the bird breeds, like the *Common Heron*, in society. Where there are no woods, the nest has been found among reeds. The eggs, four in number, are pale greenish blue.

Geographical Distribution—very wide. Since the article BITTERN was written, the Prince of Musignano has corrected the statement of its identity with the *Qua Bird*, which he notes as distinct, in his *Geographical and Comparative List*, under the name of *Nycticorax Americanus*, Bonap., *Ardea Nycticorax*, Wils. In addition to the localities given in the article above quoted, Col. Sykes notices it among the collection of birds' skins formed at the Cape of Good Hope by Captain Spiller, R.A. (*Zool. Proc.*, 1835.) It will be observed in the article BITTERN, that Le Vaillant had previously noticed it in South Africa. Mr. Gould records it, among other localities, from North Africa. Dr. Von Seebold and M. Bürger saw it in Japan. M. Lesson states that he found it at the Falkland Islands (Isles Malouines).

In Europe, M. Temminck notes it as rather abundant in most of the southern countries, but as more rare towards the north; and as not numerous in Holland. He considers the bird found in North America as the same species; but in this, it seems, he is mistaken.

In these islands the common Night-Heron is a rare visitor. In the last editions of Pennant, the specimen in the Leverian Museum, which was shot near London, is noticed, and the editor had heard of another having been killed in Suffolk; and Dr. Latham, in a note to the same work, records one that was killed at Cliefden in Buckinghamshire. He adds, that it is common in Spain and about Gibraltar, and that it inhabits China and India; and falls into the general error, as it now seems to be considered,* that the North American species is identical with it.

Montagu notices a specimen shot on the Ouse near Ampthill, and another (a young bird—*Gardenian Heron*) was shot near Thame in Oxfordshire, by Lord Kirkwall. Bewick took his figure from a specimen in the Wycliffe Museum. Two came under the observation of Mr. Selby:—one shot by the earl of Home, at the Hirsel, near Coldstream, in 1823; and another, now in Sir W. Jardine's museum, killed about two years afterwards in the neighbourhood of Dumfries. It appears in Mr. Thompson's Irish List. He saw a specimen in Dublin, which, he was informed, was sent to the bird preserver, in whose possession it was in a fresh state, from Letterkenny, early in 1834.

* Mr. Gould appears still to entertain doubts whether this bird and the North American species are not the same; for, in his magnificent work on the 'Birds of Europe,' he says, 'If not identical, the Night-Heron of North America bears so great a resemblance to the European bird, as to require an experienced eye to detect the difference; the American birds are however, we believe, larger in all their proportions.' Latham, on the contrary, says that the American birds are smaller.



Common Night-Heron.*
Front figure, adult; back figure, young.

NYCTI'NOMUS. [CHEIROPTERA, vol. vii., p. 24.]

NYCTIORNIS. [MEROPIDÆ, vol. xv., p. 118.]

NYCTI'PETES. [OWLS.]

NYCTO'PHILUS. [CHEIROPTERA, vol. vii., p. 24.]

NYKÖPING. [SWEDEN.]

NYL GHAU, or NEEL GHAU. [ANTELOPE, vol. ii., p. 76.]

NYMEGEN. [NIMWEGEN.]

NYMPHA'CEA, Lamarck's name for a family of Dimyarian conchifers, consisting of the genera *Sanguinolaria*, *Psammobia*, *Psammotea*, *Tellina*, *Tellinides*, *Corbis*, *Lucina*; *Donax*, *Capsa*, and *Crassina*. To these Mr. G. B. Sowerby suggests that *Gratelupia* and *Egeria* may be added. [CONCHACEA; CONCHIFERA; GRATELUPIA; MALACOLOGY, vol. xiv., p. 319 (*Nymphidæ*).]

NYMPHÆA'CEÆ, a natural order of aquatic plants, with floating leaves and solitary flowers, found in all the hot and temperate parts of the world. They usually have four sepals and many petals, which latter gradually contract into stamens, indefinite in number, and either hypogynous or adherent to the sides of the carpels. The ovary is superior, divided internally into numerous cells, to whose sides adhere many seeds, containing an abundance of albumen and a small embryo external to it: the stigmas radiate from the apex of the ovary. The order differs from Ranunculaceæ in the consolidation of its carpels, from Papaveraceæ in the placentation not being parietal, and from Nelumbiaceæ in the want of a large truncated disk containing monospermous achenia. The stems of these plants are fleshy rhizomata, rooting in the mud at the bottom of the waters in which they grow; and their woody tissue is so loosely disposed among the cellular, as to have given rise to a controversy concerning the real nature of the plan on which it is arranged, most writers considering, with us, that it is Exogenous, while others refer it to the Endogenous type. The species of this order are generally plants of great beauty, either the flowers or the leaves being of unusual size. The white water-lily (*Nymphæa alba*) and the yellow (*Nuphar luteum*) of our own rivers and ponds are among the finest specimens of floral development in these latitudes; in other countries both their size and colour are augmented, brilliant tints of blue and crimson being added to the pure white of our native species, and the most delicious odour being also emitted. In Demerara grows the *Victoria regia*, whose flowers have a diameter of fifteen inches, while the leaves are as much as six feet and a half across. (*Penny Magazine*, vol. vii., p. 20; and *Botanical Register* for 1836, Miscell., No. 13.) In the East Indies the *Euryale ferox*

emulates the Victoria in the size of the leaves, but its flowers are small and inconspicuous. In both these plants the farinaceous seeds are used for food.



Nymphæa alba.

1, the ovary, on which are seen the scars left by the petals and stamens removed from it; 2, a seed.

NY'MPHICUS. [PSITTACIDÆ.]

NYMPHODO'RUS, a surgeon, whose date is not exactly known, but who must have lived some time before Christ. He is mentioned by several antient authors as the inventor of a machine for reducing luxations of the femur (Cels., *De Med.*, lib. viii., cap. 20; Gal., *Comment. in Hippocr. de Artic. Libr.*, tom. xviii., pars i., p. 736, ed. Kühn), and also of a sort of box (γλωσσοκομεῖον) for fractures of the limbs (Oribas., *De Machinam.*, cap. 24). He is probably the same person as Nymphodotus mentioned by Aetius (*Tetrab.* iii., Serm. i., cap. 45, 49), Paulus Ægineta (lib. vii., cap. 12), and Galen (*De Composit. Medicam. per Genera*, lib. vi., cap. 14, tom. xiii., p. 926, ed. Kühn).

NYMPHS (Νύμφαι, *Nymphæ*) were female deities in the Greek and Roman mythology, who were supposed to preside over all parts of the earth. Those who presided over rivers, brooks, and springs, were called *Naiads*; those over mountains, *Oreades*; those over woods and trees, *Dryades* and *Hamadryades*; those over the sea, *Nereids*; those over valleys, *Napeæ*, &c. They are represented as beautiful young women; and indeed their name, which is probably connected with the Latin *nubo*, appears to have signified originally marriageable young women. They were the attendants of Hera, Aphrodite, Artemis, and other of the goddesses; and the nurses of many of the gods, as Zeus, Dionysus, and Pan. Their lives were very long, but they were not immortal. (Paus., x. 31, sect. 2.) They were worshiped in many parts of Greece, and were propitiated by offerings of milk, oil, and honey, and by sacrifices of lambs (Theocr., *Id.*, v. 53, 149); and temples were also dedicated to them in Italy. (Cic., *De Nat. Deor.*, iii. 17.) [NAIADS; NEREIDS.]

NYSSO'NIDÆ, a family of Hymenopterous insects belonging to the section Fossores. This family is thus characterised by Latreille:—Labium either entirely or for the most part hidden; the maxillæ and labium do not form a proboscis; mandibles without any internal notch; head moderately large; abdomen either conical or somewhat ovate, and with a short peduncle; antennæ filiform, with the first joint but slightly elongated.

The principal character which distinguishes this family from its congeners is the absence of a notch on the inner side of the mandibles. It contains the following genera:—*Astata, Nysson, Oxybelus, Nitela,* and *Pison.*

In the first of these genera, *Astata* of Latreille, the eyes are large and of an oval form, converging at the *vertex*, and in the male sex meeting; the mandibles are bifid at the apex: the anterior pair of wings have one narrow, short, and appendiculated marginal cell, and three submarginal cells, of which the first is narrow, longitudinal, divided obliquely near the middle by an obsolete nervure that runs from the base of the stigma to the middle of the first transverso-cubital; the second submarginal cell is triangular, and receives both the recurrent nervures; the third is very distant from the apex of the wing; the legs are moderately long and very spinous in the female.

Astata boops (Schrank) is about half an inch in length; the head, thorax, and legs are black, and the body is red, with a black tip and a small spot of black at the base. This species is found in various parts of England and on the Continent, but appears to be local. The female builds her nest in the ground, and is said to select the burrow formed by some other insect for the purpose. Mr. Shuckard, in his excellent work on the British Fossorial Hymenoptera, states that the males are much more abundant than the females; and whenever he succeeded in capturing the latter with its prey, he always found it to consist of the larvæ of *Pentatoma bidens.* Mr. Curtis has captured specimens laden with the larvæ of *Pentatoma prasina,* and a little bee (*Epeolus variegatus*) is preyed upon by the Astata to feed her larvæ.

In the genus *Nysson* (Latreille) the anterior wing has three submarginal cells; the second cell receives both recurrent nervures and is petiolated; the first submarginal cell is considerably longer than the two others; the mandibles are terminated by a simple point; the eyes are oval and prominent. Five species of this genus are recorded as British.

The genus *Oxybelus* (Latreille) is distinguished by the eye being oval and slightly prominent; the antennæ short and arcuated; the anterior pair of wings have a narrow marginal cell slightly appendiculated, and one submarginal cell, which receives a single recurrent nervure; abdomen short. Eight species of this genus are described in Mr. Shuckard's work: the most common is the *Oxybelus uniglumis,* an insect about a quarter of an inch in length; black, with a row of white spots on each side of the abdomen, and with the tibiæ and tarsi red. It preys upon flies, which it carries by its hind legs to deposit in the burrow in which the young are reared.

The genus *Nitela* (Latreille) differs from the last in having the antennæ longer and nearly straight, and with the second and third joints of equal length. Like *Oxybelus*, it has but one submarginal cell; the mandibles are bifid at the apex; there are no protuberances on the thorax, nor spines on the legs.

In the genus *Pison* (Spinola) the eyes are emarginated; there are three submarginal cells to the anterior pair of wings; the second cell is very small, petiolated, and receives two recurrent nervures.

INDEX TO THE LETTER N.

VOLUME XVI.

O.

O, in the vowel series, if arranged according to the nature of the sound, occupies the position between *a* and *u*. In the hieroglyphical characters it appears, according to Champollion, to have been a picture of an eye, and even in the old Greek alphabet it is occasionally found with a dot in the centre, to represent the pupil, for instance in the Elean Tablet. But for the different forms of the letter see ALPHABET. The changes to which this vowel is liable are numerous.

It is convertible with the adjoining vowel *u*; and indeed the two characters seem to have had a common origin. Thus, the old Greek alphabet would appear to have once terminated, like the Hebrew, with *tau*, so as to exclude the *upsilon*; whereas the Etruscans had a *u* but no *o*. Hence the predominance of the *o* in Greek, of the *u* in Latin. Within the limits of the Latin itself the two letters are often interchanged, out of which arises the confusion between the second, or *o*, and the fourth, or *u* declension, to both of which belong *ficus, cibus, senatus, tumultus, ornatus, laurus, domus*, &c. The words *consul* and *consulere* also appear as *cosol* and *cosolere*, and they have both a common root with *solium*, a seat. The English language, too, has often an *o* written where *u* is heard, as *one, none, once, come, done, won, some*.

2. With *a*. Grimm has pointed out this change as existing between the Latin and Teutonic tongues, as *doma-re, longus, odium*, &c., compared with *zähm-en, lang, hass*, &c. Hence too the double form of the name *Longobardi* and *Langobardi*. So, in Latin, from the root *gno* (*gnosco*) were formed *gnarus* and *ignarus*; and again, from these *narrare* and *ignorare*, in the latter of which the original vowel reappears. Again, with *clarus* is connected *gloria*, as closely as *gratia* with *gratus*. It is probable too that the masculine *bono* and the feminine *bona* were mere dialectic varieties which originally had no distinction of gender. Thus in the Gothic the converse prevails, the forms in *o* being feminine, those in *a* masculine. Lastly, the English and Scotch have many instances of the interchange, as *one, two, stone*, in the one, *ane, twa, stane*, in the other; but perhaps this change belongs to the next head.

3. With the long *ē*, the sound of which must be considered as the same with the English *a*. Hence in Greek, Ευπατωρ, απατωρ, &c., from πατηρ; and the Latin *sol cor* correspond with the Greek ἡλιος and κηρ (observe too the German *herz*). The town *Nemetum* in Gallia is called by Greek geographers Νεμωσσος, and the German *jener* is in English *yon*.

4. With *ou*. This interchange is virtually the same with the first-mentioned. It is not uncommon in French, as compared with Latin, as *novella, nouvelle; rota, roue; totus, tout*, &c.

5. With *uo*, especially in Italian, as *huomo, buono, luogo, nuovo*, from the Latin *homo, bonus, locus, novus*.

6. With *eu*, in French, as *lieu, feu, jeu, peu, leur, heure, douleur, queue*; from the Latin, *locus, focus, jocus, pauci* (and Italian, *poco*), *illorum, hora, dolor, cauda* or *coda*.

7. With *au*. This exists within the Latin; as *cauda* and *coda, cautes* and *cotes, caudex* and *codex, Claudius* and *Clodius, plaudo* and *plodo*. So from the Latin *aurum, audere* (whence the frequentative *ausare*), *Aufidus, audire*, the Italians have *oro, osare, Ofanto*; and the French *or, oser, ouir*. Hence too the French pronunciation of the diphthong *au*.

8. With *oa*. Thus the English words *boat, oath, oak*, must have received their present orthography when both the vowels were pronounced, as they still are in some parts of England, *bo-at, o-ath*, or *boo-at, oo-ath*.

9. With *ue*, as in Spanish *bueno, luego, fuego, huesped*; from the Latin *bonus, locus, focus, hospes*.

10. An initial *o* with *hue* or *hui*. Hence from the Latin *ostium, ostiarius*, are derived the French *huis, huissier*, and the English *usher*. From the Latin *os*, a bone, *ovum*, an egg, the Spaniards have *hueso, huevo*. From the Latin *octo, ostrea*, come the French *huict* or *huit, huistre* or *huître*. From the Latin *hodie*, which appears to have been pronounced as the Italian *oggi*, was formed the French *hui*, in *au-jour-d'-hui*.

11. In the paragraphs numbered 5, 9, and 10, the *o* really takes the sound of the English *w*, or the Greek digamma; and the same is the case in the Greek language itself, as in οικος, οινος, οιδα, Οαξος (which is the true reading in Herodotus, iv. 154), for Ϝοικος, Ϝοινος, Ϝιδα, Ϝαξος; the first three of which may be compared with the Latin *vicus, vinum, video*. Closely allied hereto is the frequent interchange in Latin of *oe* or *oi* with *ū*. [U.]

12. With *ea*, as between German and English. Thus the former language has *strom, brot, gross, tod, drohen*; the latter *stream, bread, great, death, threaten*. This same change exists in the English by itself, as *cleave, clove; weave, wove; heal, whole; heat, hot*, &c.

13. With *ei*, pronounced as the English long *i*. This is exceedingly common in the same languages. Compare the German *beide, bein, ein, nein, geist, heim, heiss, kleiden, mannheit, meist, theil, heilig, reihe, speiche, zeichen*; with *both, bone, one, none, ghost, home, hot, clothe, manhood, most, dole, holy, row, spoke* of a wheel, *token*. This change also exists within the English language, as *shine* and *shone; strike* and *stroke; drive* and *drove*.

14. A short *ŏ* with a short *ĕ*. This is particularly common in Greek, and above all in the penult of dissyllables. Thus with νεμω, στελλω, λεγω, there co-exist the substantive forms νομος, στολος, λογος. The Latin commonly prefers the *ŏ* in such words. Hence to the Greek πεπτω, επι, εννεα (ενvεϜα), νεος (νεϜος), εμεω (ϜεμεΩ), correspond the Latin *cŏquus* and *pŏpina, ŏb, nŏvem, nŏvus, vŏmo*. The change of these vowels is exceedingly common when preceded by a *w* sound, especially if an *r* or *l* follow. Hence in Latin, *verto* and *vorto, velle* and *vŏlo, vester* and *voster, vĕto* and *vŏto*. Hence likewise to the Latin *vermis, vellus, verruca*, correspond the English *worm, wool, wart*. Again, the German *schwerdt* is in English *sword*; and *vice versâ* the German *ant-wort* (as it were *anti-word*) is in English *answer*; and lastly, many words of this form are written with an *o* and pronounced with an *e*, as *wort, worm, worth, worse*.

15. For the tendency of the final letter *n* to disappear after *o*, see N.

OAK. [QUERCUS.]

OAK BARK. [BARK.]

OAKHAM. [RUTLANDSHIRE.]

OAKHAMPTON. [DEVONSHIRE.]

O'ASIS (in Greek, Ὀασις, and sometimes Αὐασις) is the appellation given to those fertile spots watered by springs and covered with verdure which are scattered about the great sandy deserts of Africa. [DESERT.] In Arabic they are called wadys. The Arabic and the Greek name seem to contain the same root, and possibly the word may be originally a native African term. The most noted are in the Libyan desert, namely, AUGILA, SIWAH, the great oasis west of Thebes, or El Khargeh, the little oasis, or Wah el Bahryeh, and several smaller ones which are noticed under EGYPT. Fezzan also may be considered as a great oasis of the Sahara. Hornemann has described Fezzan; Browne has given an account of the oasis of El Khargeh, and Cailliaud of the smaller oases west of Egypt.

The oases appear to be depressions in the table-land of Libya. On going from the Nile westward, the traveller gradually ascends till he arrives at the summit of an elevated plain, which continues nearly level, or with slight undulations, for a considerable distance, and rises higher on advancing towards the south. The oases are valleys sunk in this plain, and when you descend to one of them you find the level space or plain of the oasis similar to a portion of the valley of Egypt, surrounded by steep hills of limestone at some distance from the cultivated land. The low plain of the oasis is sandstone or clay, and from this last the water rises to the surface and fertilises the country; and as the table-land is higher in the latitude of Thebes than in that of lower Egypt, we may readily imagine that the water of the oases is conveyed from some elevated point to the south, and being retained by the bed of clay, rises to the surface wherever the limestone superstratum is removed. (Sir J. Gardner Wilkinson 'On the Nile, and the present and former Levels of Egypt,' in *Journal of the London Geographical Society*, 1839.) [OLYMPIODORUS.]

OATES, TITUS, was the son of a ribbon-weaver, who, having seceded from the Anabaptists, among whom he was a preacher, conformed to the doctrines of the English established church, took orders, and held a benefice. He was educated at Merchant Taylor's school in London, and at the university of Cambridge. Having received ordination, he became chaplain to the duke of Norfolk, who also settled him in a small living. (Hume.) He was subsequently accused of perjury, but he escaped conviction, and became chaplain in one of the king's ships, from which he was disgracefully expelled. Shortly after he embraced Roman Catholic doctrines, entered the College at St. Omer, and though more than 30 years of age, resided for some time among the students. On his return from a mission to Spain in 1677, the Jesuits, who were heartily tired of their convert, dismissed him from their seminary; and it is probable that resentment for this dismissal, combined with a prospect of gain, induced him to contrive the 'Popish Plot,' which alone has preserved his name from being forgotten.

In September, 1678, he made a disclosure before Sir Edmundbury Godfrey, a noted and active justice of the peace, and afterwards before the council and the House of Commons, to the effect 'that the pope felt himself entitled to the possession of England and Ireland on account of the heresy of prince and people, and had accordingly assumed the sovereignty of these kingdoms; that power to govern them had been delegated by the pope to the society of Jesuits, who, through Oliva, the general of their Order, had issued commissions appointing various persons whom they could trust to the chief offices of state, both civil and military. Lord Arundel, he said, was to be chancellor; Lord Powis, treasurer; Lord Bellasis, general of the papal army; Lord Stafford, paymaster; Sir William Godolphin, privy seal; and Coleman, secretary of state. All the dignities too of the church, he alleged to be newly appropriated, and many of them to Spaniards and other foreigners. Two men named Grove and Pickering, he declared, were hired to shoot the king, and that Sir George Wakeman, the queen's physician, had engaged to poison him, the queen herself being privy to the scheme. He also stated that the Roman Catholics were to rise in different districts of the kingdom, and that every means would be adopted for the extirpation of Protestantism.' His evidence was confirmed by two men named Tonge and Bedloe, especially the latter, a man of low extraction and bad reputation. (For Tonge see Evelyn's *Memoirs*, 8vo., vol. ii., p. 450; for Bedloe, Lingard, vol. xiii., p. 97, and Hume.) For the list of persons, both Jesuits and men of importance in this kingdom, who suffered imprisonment and execution through the accusations of Oates, we must refer to the general histories of the time.

Notwithstanding the almost universal credence which was given to him at the time, it has subsequently been placed beyond doubt that the plot which Oates pretended to reveal was an infamous and perjured fabrication. His circumstances, his character, the nature of his evidence, the manner of its production, not at one time but at several times, though he had previously professed to have told all that he knew, the mode in which the first disclosure was made, together with inconsistency and errors, evidently betray imposture. 'While in Spain he had been carried, he said, to Don John, who promised great assistance to the execution of the Roman Catholic designs. The king asked him what sort of a man Don John was? He answered, a tall, lean man; directly contrary to the truth, as the king well knew. He totally mistook the situation of the Jesuits' college at Paris. Though he pretended great intimacy with Coleman, he did not know him when placed very near him, and had no other excuse than than his sight was bad in candle-light.' He also fell into other errors. (Hume.) We mention these particular proofs of falsehood, but little reliance can be placed on the evidence of a man who, if his word was to be believed, had entered the Jesuits' society with the sole purpose of 'gaining their secrets in order to betray them.'

It may be urged, that the universal credit given to Oates's evidence at the time is a strong proof that his story was true. There are circumstances however which account for the ready belief with which his accusations were received, although they do not prove their truth.

The English Protestants had long apprehended an attempt on the part of the Roman Catholics to restore their religion and re-establish their power; and their anxiety on this account had latterly been augmented in some degree by the conduct of the king, and in a still greater degree by the Duke of York's open profession of the old religion and his attachment to its adherents. Moreover there were immediately connected with Oates's disclosure two events giving it an apparent corroboration, which was eagerly assumed to be real by the feverish minds of contemporary partisans. The first of these was the sudden and violent death of Sir Edmundbury Godfrey, the magistrate who had taken Oates's depositions. No proofs could be adduced to show the manner of his death. Whether he committed suicide or was murdered has never been ascertained; but the fact that he had taken Oates's evidence, and had been active in searching out the supposed plot, was sufficient to convince the Protestants, excited as they then were, that he had been murdered by Roman Catholics, partly out of revenge and partly to aid the escape of their conspirators. The second apparent corroboration of Oates's evidence, which, though no real confirmation, had at the time an influence in maintaining its credibility, is, that it led to the discovery of a plot, though not such a plot as he disclosed. (Hallam, *Const. Hist.*, ii., p. 571.) Oates denounced Coleman, the secretary of the Duchess of York; and upon searching his house, there were found, among his correspondence with Père la Chaise, papers which proved a combination for the purpose of re-establishing Roman Catholicism in England. That it was a plot, that it was on the part of the Roman Catholics, and discovered through Oates, was sufficient in the then temper of Protestants to reflect credit on his disclosures, though Coleman's plans did not coincide with the schemes which Oates pretended to have discovered.

During the closing years of Charles II.'s reign, Oates was protected by the government, and received a pension of 1200*l.* a year. In the following reign, as might be expected, his enemies revenged themselves. The Duke of York had not long succeeded his brother on the throne, before Oates was tried and convicted of perjury, sentenced to imprisonment for life, and to be whipped and stand in the pillory at intervals. The punishment was so rigidly enforced, that Hume states it must have been the intention of the government that it should terminate his life; he lived however until William's reign, received a second pension of 400*l.* a year, and died at an advanced age. Grainger says that there have been published under his name, though for a clergyman he was an illiterate man, 'A Narrative of the Popish Plot;' 'The Merchandize of the Whore of Rome;' and 'Eikon Basilike, or a Picture of the late King James.' A full account of his evidence and the Popish plot is given by Rapin, and in the 'State Trials.' See also Hume, Lingard, Burnet, Evelyn, and Hallam's *Const. Hist.*

OATH. Oaths have been in use in all countries of which we have any exact information, and it is probable that there is no nation which has any clear notion of a Supreme Being, or of superior beings, that does not make use of oaths on certain solemn occasions. An oath may be described generally as an appeal or address to a superior being, by which the person making it engages to declare the truth on the occasion on which he takes the oath, or by which he promises to do something hereafter. The person who imposes or receives the oath, imposes or receives it on the supposition that the person making it apprehends some evil consequences to himself from the superior Being, if he should violate the oath. The person taking the oath may or may not fear such consequences, but the value of the oath in the eyes of him who receives or imposes it consists in the opinion which he has of its influence over the person taking it. An oath may be taken voluntarily, or it may be imposed on a person under certain circumstances by a political superior; or it may be the only condition on which the assertion or declaration of a person shall be admitted as evidence of any fact.

The form of taking the oath has varied greatly in different countries. Among the Greeks, a person sometimes placed his hand on the altar of the deity by whom he swore; but the forms of oaths were almost as various as the occasions. Oaths were often used in judicial proceedings among the Greeks. The Dicastæ, who were judges and jurymen, gave their verdict upon oath. The Heliastic oath is stated at length in the speech of Demosthenes against Timocrates (c. 36). It does not appear that the oath was always imposed on witnesses in judicial proceedings; and yet it appears that sometimes witnesses gave their evidence on oath: perhaps the oath on the part of witnesses was generally voluntary.

(Demosth., Πρὸς Ἄφοβον Ψευδ. c. 16; Κατὰ Κόνωνος, c. 10; and Meier and Schömann, *Att.* Process., p. 675.)

In the Roman jurisprudence, an oath was required in some cases from the plaintiff or the defendant, or both. Thus the oath of calumny was required from the plaintiff, which was a solemn declaration that he did not prosecute his suit for any fraudulent or malicious purpose. The offence of false-swearing was *perjurium*, perjury; but it was considered a less offence in a party to a suit when the oath was imposed by a *judex* than when it was voluntary. It does not appear that in civil proceedings witnesses were necessarily examined on oath; but witnesses appear to have been examined on oath in the judicia publica, which were criminal proceedings. The title in the *Digest*, 'De Testibus' (22, tit. 5), makes no mention of the oath, though it speaks of punishment being inflicted on witnesses who bore false testimony.

The law of England, as a general rule, requires all evidence or testimony for judicial purposes to be given on oath, and all persons may be sworn as witnesses who, being questioned on the occasion of taking the oath, will declare their belief in the existence of God, in a future state of rewards and punishments, and who will further declare their belief that perjury will be punished by the Deity. This rule permits all persons, of all religious persuasions, who profess to have the necessary belief, to be sworn as witnesses; and it excludes all other persons from being witnesses. A Jew, a Mohammedan, and a Hindu may be sworn as witnesses, but they must severally take the oath in that form which is sanctioned by the usage of their country or nation, and which they severally consider to be binding. It follows that a person who professes atheism, or who does not profess such belief as is stated above, cannot be sworn, and consequently cannot be admitted to give testimony for judicial purposes. Children also who are too young to understand the nature of an oath, and adults who are too ignorant or too weak in intellect to understand what is meant by an oath, cannot be sworn as witnesses. The offence of declaring what is false, when a witness is examined upon oath, constitutes perjury: the particular circumstances which must concur in order that false-swearing shall be legal perjury are stated under that head. [PERJURY.]

Declarations made by a person under the apprehension of immediate death are generally admitted as evidence in judicial proceedings, when properly verified; for it is considered that the circumstances in which the person is placed at the time of making the declaration, furnish as strong motives for veracity as the obligation of an oath. Quakers also, in all civil cases, were allowed by the statute 7 and 8 Wm. III, c. 34, to give their evidence on affirmation; and now the affirmation of Quakers and Moravians is admissible in all judicial proceedings, both civil and criminal. When a defendant in chancery is entitled to privilege of peerage, or as a lord of parliament, he is required to give his answer to a bill upon honour only; and in the case of a corporation, the corporate body defendants put in their answer under their common seal. Other defendants are required to put in their answer upon oath. For other matters connected with judicial evidence see EVIDENCE.

An oath is required in England in a great many cases besides judicial proceedings, as for instance, on admission to places of public trust, and on a variety of other occasions. By an act of the 5 and 6 Wm. IV., c. 62, the lords of the Treasury are empowered to substitute a declaration in lieu of an oath, solemn affirmation, or affidavit, in a variety of cases, such as relate to the revenues of Customs or Excise, the Post Office, and other departments of administration mentioned in the second section of this act. This act also substitutes declarations in lieu of oaths, solemn affirmations, and affidavits, in various other cases enumerated in the act, for instance, where a person seeks to obtain a patent under the Great Seal. Justices of the peace and others are (s. 13) prohibited from administering or receiving oaths, affidavits, or solemn affirmations, touching any matter or thing whereof such justice or other person has not cognisance or jurisdiction by some statute in force at the time; with certain exceptions however, specified in the latter part of this section. The object of this section was to put an end to the practice of administering and receiving oaths and affidavits voluntarily made in matters not the subject of any judicial inquiry, nor in anywise pending or at issue before the person by whom such oaths or affidavits were administered or received. But this act does not extend or apply to cases where the oath of allegiance then was or thereafter might be required to be taken by any person who may be appointed to any office; nor does it extend or apply to any oath, solemn affirmation, or affidavit, which then was or thereafter might be made or taken, or required to be made or taken, in any judicial proceeding, in any court of justice, or in any proceeding for or by way of summary conviction before any justice of the peace. (s. 7.) Persons who wilfully and corruptly make or subscribe any declaration, under the provisions of this act, knowing the same to be untrue in any material particular, are declared (s. 21) to be guilty of a misdemeanor. The statute of 1 and 2 Vic., c. 77, provides the same privilege of solemn affirmation for persons who have been Quakers or Moravians, and have ceased to be such, but still entertain conscientious objections to the taking of an oath, as they would have enjoyed if they were still Quakers or Moravians.

As oaths may be either voluntary or may be imposed by a political superior, so they may be imposed either on extra-judicial or on judicial occasions. Oaths which are imposed on occasion of judicial proceedings are the most frequent in this country, and the occasions are the most important to the interests of society. The principle on which an oath is administered on judicial occasions is this: it is supposed that an additional security is thereby acquired for the veracity of him who takes the oath. Bentham, in his 'Rationale of Evidence,' on the contrary, affirms that 'whether principle or experience be regarded, the oath will be found, in the hands of justice, an altogether useless instrument; in the hands of injustice, a deplorably serviceable one;' 'that it is inefficacious to all good purposes,' and 'that it is by no means inefficacious to bad ones.' As the policy of abolishing oaths has been a matter of some discussion, and is one of great importance, a few words on the subject may not be out of place.

The three great sanctions or securities for veracity in a witness, or, to speak perhaps more correctly, the three great sanctions against mendacity in a witness, are, the punishment legally imposed on a person who is convicted of false swearing, the punishment inflicted by public opinion or the positive morality of society, and the fear of punishment from the Deity in this world or the next, or in both. The common opinion is, that all the three sanctions operate on a witness, though they operate on different witnesses in very different degrees. A man who does not believe that the Deity will punish false swearing, can only be under the influence of the first two sanctions; and if his character is such that it cannot be made worse than it is, he may be under the influence of the first sanction only. Bentham affirms that the third sanction only appears to exercise an influence in any case, because it acts in conjunction with 'the two real and efficient sanctions,' 'the political sanction and the moral or popular sanction;' and that if it is stripped of those accompaniments, its impotence will appear immediately. This experiment of stripping cannot easily be made, but a little consideration may help us to a solution of the question in another way.

Bentham's chief argument is as follows: 'that the supposition of the efficiency of an oath is absurd in principle. It ascribes to man a power over his Maker. It supposes the Almighty to stand engaged, no matter how, but absolutely engaged, to inflict on every individual by whom the ceremony, after having been performed, has been profaned,—a punishment (no matter what) which, but for the ceremony and the profanation, he would not have inflicted. It supposes him thus prepared to inflict, at command, and at all times, a punishment, which, being at all times the same, at no time bears any proportion to the offence.' Again: 'either the ceremony causes punishment to be inflicted by the Deity, in cases where otherwise it would not have been inflicted; or it does not. In the former case, the same sort of authority is exercised by man over the Deity, as that which, in English law, is exercised over the judge by the legislator, or over the sheriff by the judge. In the latter case, the ceremony is a mere form without any useful effect whatever.'

The absurdity of this argument hardly needs to be exposed. He who administers the oath, by virtue of the power which he has to administer it, and the political superior who imposes the oath, may either believe or not believe that the Deity will punish false swearing, and it is quite immaterial to the question, which of the two opinions they entertain. That which gives the oath a value in the eyes

of him who administers it, or of that political superior who imposes it, is the opinion of the person who takes the oath; and if the individual who takes the oath believes that the Deity, in case it is profaned, will inflict a punishment which otherwise he would not inflict, the object of him who enforces the oath is accomplished, and an additional sanction against mendacity is secured. It matters not whether the Deity will punish or not, nor whether he who enforces the oath believes that he will punish or not; if he who takes the oath believes that the Deity will punish false swearing, that is sufficient to show that the oath is of itself a sanction.

The fear of legal punishment is admitted by Bentham to be a sanction against mendacity. But the legal punishment may or may not overtake the offender. Legal punishment may follow detection, but the perjury may not be detected, and therefore not punished. Is the oath, or would a declaration without oath be, 'a mere form without any useful effect whatever,' because the legal punishment may not and frequently does not overtake the offender? When a Greek or a Roman swore by his gods, in whose existence he believed, and who, being mere imaginations, could not punish him for his perjury, was not his belief in their existence and their power and willingness to punish perjury a sanction against mendacity? All antiquity at least thought so.

There are occasions on which oaths are treated lightly, on which he who imposes the oath, he who takes it, and the community who are witnesses to it, treat the violation of it as a trivial matter. Such occasions as these furnish Bentham with arguments against the efficacy of oaths on all occasions. Suppose we admit, with Bentham, as we do merely for the sake of the argument, that 'on some occasions oaths go with the English clergy for nothing;' and this, notwithstanding the fact, which nobody can doubt, 'that among the English clergy believers are more abundant than unbelievers.' The kind of oaths 'which go for nothing' are not mentioned by Bentham, but they may be conjectured. Now, if all oaths went for nothing with the clergy, or with any other body of men, the dispute would be settled. But this is not the fact. If in any way it has become the positive morality of any body of men that a certain kind of oath should go for nothing, each individual of that body, with respect to that kind of oath, has the opinion of his body. He does not believe that such oath, if broken, will bring on him divine punishment, and therefore such oath *is* an idle ceremony. But if there is any oath, the violation of which he thinks will bring on him divine punishment, his opinion as to that kind of oath is not at all affected by his opinion as to the other kind of oath. Now, oaths taken on judicial occasions are by the mass of mankind considered to be oaths of the latter kind, and therefore they have an influence on the great majority of those who take them. Whether society will in time so far improve as to render it safe to dispense with this ceremony in judicial proceedings, cannot be affirmed or denied; but a legislator who knows what man now is, will require better reasons for the abolition of judicial oaths than Bentham has given.

How far the requisition of an oath may be injurious in excluding testimony in certain cases, and how far oaths on solemn and important occasions may be made most efficacious, and in what cases it may be advisable to substitute declarations in lieu of oaths, are not matters of consideration here. It is enough here to show that an oath is a sanction or security to some extent, if the person who takes it fears divine punishment in case he should violate it; and that this, and no other, is the ground on which the oath is imposed.

Indeed it is evident that in English procedure the professed opinion or belief of the person who takes the oath is the only reason for which courts of justice either admit or refuse to receive his evidence; and this is shown by the questions which may be put to a witness when he comes to deliver his evidence in a court of justice.

There is some difficulty in stating accurately how far oaths were required from witnesses in Roman procedure under the republic and the earlier emperors. In addition to what has been stated, the reader may refer to Cicero, *Pro Q. Rosc. Comoed.*, c. 15, &c.; Noodt, *Op. Omn.*, ii. 479, 'De Testibus;' and to the commentary of Asconius on the Verrine Orations. By a constitution of Constantine, all witnesses were required to give their testimony on oath; and this was again declared by a constitution of Justinian. (*Cod.* 4, tit. 20, s. 9, 16, 19.)

Many persons conscientiously object to the taking of an oath on religious grounds, and particularly with reference to our Saviour's prohibition (*Matth.*, v. 33). On the subject of oaths in general the reader may consult Grotius, *De Jure, B. & P.*, lib. ii., c. 13; Paley's *Moral Philosophy*, Tyler's *Origin and History of Oaths*; the *Law Magazine*, vol. xii.; and the work of Bentham already referred to.

OATS (*Avena sativa*) is a well-known species of the genus *Avena*, a plant of the family of the Gramineæ, in the class Triandria Digynia of Linnæus. [AVENA.] We shall here only consider those varieties which are cultivated for their grain, principally as food for horses, and in some cases for men also, when ground into oatmeal or grits.

The great use of oats, and the ease with which they are raised on almost every kind of soil, from the heaviest loam to the lightest sand, have made them occupy a place in almost every rotation of crops. Before agriculture had been subjected to regular rules, the result of long experience, the land was often sown as long as any return could be obtained, before any means of recruiting it with manure were thought of; and the last crop which would return any increase of the seed was generally oats. After this the land, no longer repaying the labour of ploughing and sowing, was abandoned, till, by length of time and the decomposition of roots and weeds, some renewed fertility was produced. Of all the plants commonly cultivated in the field, oats seem to have the greatest power of drawing nourishment from the soil, and hence are justly considered as greatly exhausting the land. Some farmers on this account prefer buying all their oats in the market to raising them on their own land. Where the soil is well adapted to the growth of wheat and barley, which bear a better price, this may be a judicious plan; but as a general rule, it is always more profitable to raise oats for home consumption than to trust to a fluctuating market. With proper management, a crop of oats may give as great a profit on the best land as any other crop, when it is considered that it requires less manure and produces an abundance of straw, which is very fit for the winter food of horses and cattle, especially when aided by roots or other succulent food.

To make a crop of oats profitable, some attention must be paid to the preparation of the soil and to free it from weeds; for to sow oats on a foul wheat or barley stubble slightly turned in by the plough, as is sometimes done, is the reverse of good husbandry.

The best oats are raised in Scotland and in Friesland, and in both countries the land is carefully cultivated. In Scotland, oats are generally sown on a grass layer which has been in that state for some years, and sometimes on old pastures which are broken up for the purpose. The crops exceed in bulk and weight of grain all that the most sanguine person, unacquainted with the system, would expect, and in many seasons, not favourable for the wheat crop, oats are much more profitable. Wherever the land is not of a good quality, and wheat is apt to fail, oats are a much safer crop, especially in retentive soils, as rye is on poor sands.

When oats are sown after turnips, cabbages, or any other green crop, the land should be well ploughed, if the green crop was not consumed on the spot, and a moderate supply of manure will be well repaid by the increased produce. A heavy loam is best suited for oats: they require a certain degree of moisture, and a deep soil is very favourable to their growth. On land which has been trenched, or where the subsoil plough has been used, after careful draining, if required, oats will thrive wonderfully, without requiring so rich a soil as barley or wheat. The roots are hardier and have a stronger vegetative power. When once they have struck deep into the soil, a good crop, according to the quality of the land, may be relied on.

When oats are sown after artificial grasses, the land is seldom ploughed more than once, and the seed is sown on the fresh mould which has been turned up; but unless the land be very free from weeds, it would be better to plough the sward with a shallow furrow early in autumn. Before winter the scarifier would break the rotten sward, which might then be buried deep by another ploughing. The land would be ready for sowing early in spring, which is a great advantage, both as to the quality of the oat crop and the earlier harvest, especially in those districts where the latter part of the autumn is apt to be stormy and rainy. The land thus treated would be clean, and the fallow, which is often re-

sorted to, of necessity, after a crop of oats, might be dispensed with, as the weeds have been destroyed and buried deep.

When oats are sown on light land after turnips, which have been eaten by sheep folded on them, it may be ploughed with as shallow a furrow as will turn in the surface: the preparation for turnips will have sufficiently moved the soil; and the manure of the sheep should not be buried too deep. On poor moist land oats are more profitable than barley. Clover and grass seeds may be sown among them with equal advantage, as they will seldom grow so high as to be laid and smother the young clover; and barley is very apt to fail on land subject to retain the water.

In sowing oats more seed is often used than of any other grain, because, although the plants tiller where they have room, the straw of the second shoots is weaker, and the grain is not ripe so soon as that of the principal stem; but when the plants rise close and thick, there are no tillers, the main stem is stronger, and the corn is more plump and equal. Six bushels of oats are often sown on an acre; but if they are drilled, four bushels are sufficient, and when dibbled, which is sometimes the case in Norfolk and Suffolk, much less seed is used. A good preparation of the land is of more consequence than a superabundance of seed.

In a field where oats are sown broadcast, and covered by the harrows, many seeds remain exposed to the depredation of birds, which soon find them out at a time of the year when food is scarce; but when they are drilled or dibbled, all the seed is buried and germinates, without any loss. When the seed is sown and ploughed in, the same object is attained; but as the furrow must be shallow in order that the seed may not be buried too deep, the land must have been ploughed before to a considerable depth, unless it be after turnips fed off by sheep, in which case ploughing the seed in is a good practice: in either case four bushels of seed per acre is an ample allowance.

When the ground has been well prepared, there is no necessity for weeding or hoeing the crop as it advances; but if large weeds appear, such as charlock, May-weed, docks, or thistles, they must be carefully weeded out, or else the ground will be so infested with their seeds or roots that it will be difficult to eradicate them afterwards. Oats, when fully ripe, are very apt to shed, and many are lost for want of attention. As soon as the straw turns yellow under the panicle, the oats should be reaped, however green the lower part of the straw may be: the straw will be better fodder for cattle, and all the corn will be saved. Oats are generally mown with a scythe, and raked into heaps to dry like hay; but this is a wasteful and slovenly practice. A good crop of oats should be reaped, like wheat, close to the ground, and tied in sheaves. A cradle scythe or a short Hainault scythe does the work well in the hands of an expert mower, who should be followed by binders, who gather the straw with their hands, and lay it regularly on the ground, if it be not fit to tie up immediately: the straw should afterwards be tied up into sheaves, and set with the corn uppermost in shocks of ten or twelve sheaves, leaning against each other, and open at bottom, in order to allow the air to pass through. Thus, in a short time the oats become sufficiently dry to be stacked, or carried immediately into the barn. The produce of an acre of oats varies according to the soil and preparation, from four to eight and even ten quarters.

Oats ground into a coarse meal form a considerable portion of the food of labourers and many men in the middle ranks of life in Scotland, Ireland, and the north of England. The meal is simply stirred into boiling water with a little salt, until it becomes of the consistency of a hasty-pudding; it is then called porridge or stir-about; and when eaten with milk or treacle makes a wholesome and palatable food. It is sometimes mixed with the thin liquor of boiled meat, or the water in which cabbages or kale have been boiled, and acquires the denomination of beef-brose or kale-brose. When made into a dough with water, and baked on an iron plate in thin cakes, it makes a bread, which is very palatable to those who are accustomed to it, and who often prefer it to wheaten bread. Its use was once almost universal in Scotland, which has in consequence been called the Land of Cakes. In Germany and Switzerland the coarsely bruised oat-meal is put into an oven till it becomes of a brown colour; it is then called haber-meal, and is used in broths and pottages, as the semolina, made from wheat, is used in France and Italy. The coarsely broken grains, after the husk has been removed, form grits, which are extensively used to make gruel for children and invalids. The chaff of oats put into a canvas bag forms a good substitute for feather-beds for the poor, and is far more wholesome than feathers, from the ease with which it may be renewed at little or no cost.

In some countries the oats are given to horses in the straw, without threshing them; and where the quantity can be regulated, the practice is good. The horses masticate the corn better in the chaff, and the straw is wholesome; but where horses do hard work, they would be too long in eating a sufficient quantity, and it is better to give them oats threshed and cleaned, with clover hay cut into chaff. When hay is dear, it is often cheaper to increase the quantity of oats, and to give it with wheat-straw cut fine. In this way very little hay is required. The calculation is easily made when we consider that a pound of good oats gives as much nourishment to a horse as two pounds of the best clover, or saintfoin hay. A truss of hay of 56 pounds is therefore equal to 28 pounds of oats; or a bushel of the best oats will go as far as one truss and a half of hay; and if this quantity is worth four shillings, which is at the rate of 4*l.* 16*s.* per load of thirty-six trusses, the equivalent price of oats is 32*s.* per quarter.

Farmers who have hay-ricks from which they often allow their men to take as much as they please for their horses, will carefully measure out the oats, which probably are much cheaper. Some men who keep many horses, cut all the hay into chaff by a machine, and mixing this with a proper proportion of oats, feed all their horses in mangers with a certain allowance of the mixture, a practice much more economical than that usually adopted. In France and Germany the practice of baking oats, as well as rye, into loaves for horse-food, is gaining ground, and is said to be attended by an evident saving of food.

OAXACA. [Mexican States.]

OBADI'AH (עֹבַדְיָה, 'Οβδιάς) was one of the twelve minor Hebrew prophets. The name corresponds to the common Arabian name Abdallah, meaning *a servant of God;* it occurs several times in the Old Testament (1 *Kings*, xviii. 3; 1 *Chron.*, iii. 21; vii. 3; ix. 16; 2 *Chron.*, xvii. 7; xxxiv. 12); but neither of the persons mentioned in these passages appears to have been the prophet, about whose personal history we know nothing. His prophecy appears from internal evidence (verses 11-14, 20) to have been written shortly after the destruction of Jerusalem in the year 587 B.C. He was therefore contemporary with Jeremiah; and we find a striking resemblance between some passages in these two prophets (compare *Obadiah*, 1-4, 5, 6, 8, with *Jer.*, xlix. 14-16, 9, 10, 7). The question here is, which of these writers copied from the other? We know that Jeremiah quoted other prophets, and therefore it is nothing strange to find in him a quotation from Obadiah; and critics who have carefully examined the passages in question have thought that those in *Jeremiah* bear marks of being copied from *Obadiah*. The reason why the book of *Obadiah* has been placed so much out of its chronological order in the Hebrew Bible is thought to be, because its subject is so closely connected with the last verses of the prophecy of *Amos*, which immediately precedes it.

The prophecy of *Obadiah* is the shortest book in the Old Testament, consisting of only one chapter. The prophet denounces the destruction of Edom, on account of their insolent triumph in the day of the captivity of their Hebrew brethren and in the destruction of Jerusalem (verses 1-16), and foretells the restoration of the Jews, the subjection of their enemies, and of Edom among the rest, and the setting up of the kingdom of the Lord (verses 17-21). The conduct of the Edomites at the fall of Jerusalem, which is referred to in the former part of this prophecy, is not mentioned in the Old Testament history, but it is alluded to by other prophets and by a writer in the *Psalms* (*Ezek.* xxv. 12; xxxv; *Jerem.*, xlix. 7-22; *Amos*, i. 11; *Psalms*, cxxxvii. 7). The latter part is supposed to have been accomplished in the return of the Jews from Babylon and the victories of the Maccabees over the Edomites, but the last words seem to refer to the more remote period when all the world shall become the kingdom of God (compare *Rev.*, xi. 15; xix. 6). The style of Obadiah is clear and energetic; his prophecy forms a short poem.

(Rosenmüller's *Scholia*; Schnurrer's *Dissertation*; the *Introductions* of Eichhorn, Jahn, De Wette, and Horne.)

OBE'LIA. [PULMOGRADA.]

OBEIDALLAH. [FATIMIDES.]

OBELISK, from the Greek 'obeliscus' (ὀβελίσκος), the diminutive of 'obelus' (ὀβελός), which signifies a 'skewer' or 'needle' (Herod., ii. 41), but is also used by Herodotus (ii. 111) to signify an *obelisk*: the Italian name *aguglia* and the French *aiguille* (needle) are from the Latin *acus*. An obelisk is a lofty monumental four-sided shaft diminishing upwards with the sides gently inclined, but not so as to terminate in an apex at the top; neither is it merely truncated or cut off at the summit, but the sides are sloped off so as to form a flattish pyramidal figure, by which the whole is suitably finished off and brought to a point, without the upper part being so contracted as to appear insignificant. Herein, as well as in their purpose and application, besides other circumstances, obelisks differ from spires, which are carried up from their base to a point, and which nevertheless are beautiful on that very account. It may be asked why the same form that pleases the eye in the one case would be disagreeable in the other. To answer this question we must consider not only wherein they agree, but wherein they differ. Whether perfectly square or not, obelisks are uniformly quadrilateral, whereas spires are polygonal, and consequently the bases of their sides are much narrower in proportion to their entire diameter, so that the diminution is not so sudden as it would be in a four-sided mass of the same bulk and height. Secondly, a spire is generally terminated by a pinnacle, cross, or some other ornament at its summit, whereby sufficient importance is given to it; and thirdly, a spire neither is nor is intended to look like a solid mass of stone, but requires to have a certain expression of lightness, both in itself and so as to bring it into harmony with the rest of the building. An obelisk, on the contrary, either is or is intended to appear not only a solid mass, but a single stone, standing upon a massive pedestal, and that pedestal resting on the ground. Hence it is obvious that so far from being attended with any beauty, the reducing it to a mere point would greatly impair its character, and in a measure destroy all nobleness of appearance towards its summit, because it would be of inconsiderable bulk for a considerable length downwards.

Though the mere form of the obelisk has no particular beauty to recommend it, as is proved by the meanness and pettiness of little obelisks employed merely as decorations in *catafalchi*, and also in many buildings of the time of James I., yet when wrought out of 'time-defying material,' and of colossal dimensions, it produces a most imposing effect. As a monument an obelisk is greatly preferable to a column, inasmuch as it possesses all that recommends the latter without being open to the objection of being a mere imitation of what was designed for a totally different purpose, and never intended to be insulated or considered as complete in itself. The greater diameter of the capital and abacus, which is both a beauty and propriety in a column supporting a superincumbent mass, ceases to be so, or rather becomes quite the contrary, when the column supports nothing. The abacus, forming in fact a square platform on its summit, overhanging the structure itself at its angles, gives the whole a top-heavy appearance, which is still further increased by a railing upon it. The London Monument and the York Column in London are examples of this perversion. Though not properly an obelisk, it being built up of masonry, the Wellington Testimonial in Phœnix Park, Dublin, is a much nobler object than a column of the same dimensions would have been; and it is to be regretted that the obelisk form was not made choice of for the monolith of Finland granite (84 feet high) erected at St. Petersburg as the Alexander column. Where, instead of being one solid mass, a monument of the kind must be constructed of separate stones, there may so far be some reason for rejecting obelisk shape; yet where the greatest difficulty was accomplished, namely, that of obtaining a monolith of sufficient dimensions, very little short of those of the largest ancient obelisks, and exceeding the generality of them, it was unfortunate that the usual pillar-shape was preferred, surmounted by the usual square platform.

Much learning and research have been expended by Zoega and others in endeavouring to ascertain the origin of obelisks, yet without throwing any very satisfactory light on that part of the question. Antiquaries have in fact endeavoured to find positive evidence where none was to be obtained; for the case itself is not, like that of a particular invention or discovery, referrible to some precise period or nation. On the contrary, from the very earliest ages it had been the practice to mark some particular spot, the scene of some important event, by what might serve as a durable monument of it; nor would any thing more naturally suggest itself for such purpose than fixing in an upright position a stone of unusual dimensions. The Bible makes mention of this practice; and it prevailed not only in the East, and in the early ages of the world, but has prevailed among nearly all nations either in a savage state or in an early stage of civilization. Among the Egyptians therefore the practice was not otherwise very remarkable than on account of their continuing it, and bringing such simple primæval monuments to great perfection, making them of stupendous dimensions, working them in the most elaborate manner, and adorning them with hieroglyphics, though not indeed invariably, for there are instances of Egyptian obelisks which are not so sculptured; among others that in front of St. Peter's at Rome, and the one before the church of Santa Maria Maggiore.

Small obelisks were sometimes of sandstone or granite, but the larger Egyptian obelisks are all of the red granite of Syene; and it is certainly astonishing how such enormous masses of that material could be quarried out, and afterwards removed and placed in their position. We may conjecture that the Egyptians detached the large masses of rock for their obelisks somewhat in the same way that was adopted by the natives of India on the occasion of raising the great granite obelisk at Seringapatam in the year 1805. In this instance a groove about two inches wide and deep was chiselled out by the workmen in the line where it was required to separate the stone; which being done, a fire was kindled upon it from end to end, and kept up until the stone was sufficiently heated, when the embers were blown off, and cold water poured into the groove, whereby a clear fracture in the stone was made without further labour. Indeed the mode in which the Egyptians worked their quarries is clear enough at the present day from an inspection of the excavations: see Gau's *Nubia*, pl. 9, and the French work on Egypt, *Antiq.*, i., pl. 32. Among the Egyptians, when the block had been thus hewn out of the quarry, it was conveyed away by a raft on a canal brought up to the very edge of the rock, either at the time of the inundation, when the water would rise to a sufficient level, or by lowering the block down an inclined plane or platform to the raft; or by digging a canal from the river to the site of the block, and bringing a boat under the obelisk, in the manner described by Pliny (xxxvi., chap. 9). The granite block was afterwards polished, and probably raised in the same way as the Seringapatam obelisk, by means of banks of earth.

For raising the obelisk before St. Peter's (supposed to be that brought from Heliopolis by Caligula), no fewer than five hundred different projects were submitted by architects and engineers to the pope Sixtus V., and Domenico Fontana was thought to have accomplished little short of a miracle in rearing it by means of very complex machinery and several hundreds of workmen and horses. The process by which the Lateran obelisk was originally erected at Rome seems to have been equally complicated and laborious. (Ammian. Marcell., xvii. 4.) How the Egyptians raised such masses of granite is not known, but probably by a much simpler mode, whether similar or not to that practised in elevating upon its pedestal the one at Seringapatam. According to Colonel Wilks's account of the operations, this obelisk, a single stone about sixty feet long and six square at its base, was placed horizontally upon a mound, or platform of earth, secured by strong walls, and level with the top of the pedestal, the base of the obelisk being placed just on the ledge of the pedestal. The shaft having been laid on planks or timber poles, these served as fulcra, by means of which the smaller end or top was gradually raised; wedges were put under it and earth rammed in, which was repeated until the platform became an inclined plane as steep as it could with safety be carried up. The shaft being got thus far out of its horizontal position towards a perpendicular one, ropes were then applied, worked from a strong timber scaffold nearly as high as the obelisk itself, and enclosing the other three sides of the pedestal, other ropes being also employed in a contrary direction in order to check its coming down on the pedestal with too sudden a shock.

By the Egyptians themselves obelisks do not appear to have been raised as insulated monuments or single objects,

but as the accompaniments to temples and palaces, where they were placed in pairs, that is, one on each side of a large entrance, or *propylon*, and it may therefore be inferred that some particular signification was attached to them. They were also sometimes placed in the interior courts of temples. With respect to their proportions, the shafts of obelisks were usually about ten diameters in height, and one-fourth narrower at top than at their base. The pyramidion, or apex, was made much more pointed in some obelisks than in others. One singularity is that few Egyptian obelisks are perfectly square, two of their sides being generally somewhat broader than the other two, which may be accounted for by what has just been said, namely, that they were placed against buildings, and not intended to be insulated objects viewed from every direction. The face of an obelisk is sometimes slightly convex, instead of being quite plain; as is the case with one side of the Lateran obelisk.

The number of obelisks in Egypt must have been at one time very considerable, yet we are not therefore to suppose that the erection of them was a frequent circumstance, since, once formed, they were almost imperishable, and would therefore greatly increase in the course of ages. Many that are still remaining are no longer standing; and in some places several have been found on the same spot, some still standing, others lying on the ground. When the Romans became masters of Egypt, they removed many of these monuments to their own capital, among others that of the Lateran, which is the largest now known, its shaft being 105 feet (although it has been reduced, a portion at the lower part having been cut off in consequence of being fractured), and two of its sides 9 feet 8½ inches, the other two 9 feet. This obelisk was first conveyed from Heliopolis to Alexandria by Constantine, and by that emperor's son Constantius brought from the latter city to Rome, where it was erected in the Circus Maximus. The shaft of the Lateran obelisk weighs about 445 tons in round numbers. Augustus also had previously brought two from Heliopolis. That which was originally placed in the Vatican Circus by Caligula, and now stands in the piazza of St. Peter's, is next in size to that of the Lateran, though supposed to have been somewhat abridged of its original dimensions. The entire height, including the pedestal and the ornament at top, is about 132 feet; the shaft itself is 83 feet, and 8 feet 10 inches square at its base, and 5 feet 11 inches at the other end. In the At-Meidan at Constantinople there is an obelisk about 50 feet high, said to have been erected by the emperor Theodosius.

During the calamities that befel Rome under its barbarian invaders after the downfal of the empire, the obelisks were damaged and overthrown, but they have been gradually restored under various pontiffs. The following table contains a list of the Roman obelisks, with their dimensions and other particulars:—

I.—Sixtus V., 1586.

The Vatican, in front of St. Peter's, where it was removed by Fontana from the Vatican Circus. On the side facing the church, and on the opposite side, we see the dedication to Augustus and Tiberius.

		ft.	in.
Whole height		132	2
Ditto without base and modern ornaments at top, cross, &c.		83	2·8

Without hieroglyphics, and still entire.

II.—Sixtus V., 1587.

In front of the church of Santa Maria Maggiore, erected by Fontana.

		ft.	in.
Whole height		83	9·5
Ditto without base and modern ornaments at top, cross, &c.		48	4·8

Without hieroglyphics; broken in three or more places.

III.—Sixtus V., 1588.

In front of the St. John Lateran church, erected by Fontana.

		ft.	in.
Whole height		149	7·2
Without base, &c.		105	7·2

Hieroplyphics; broken in three pieces.

IV.—Sixtus V., 1589.

Flaminio del Popolo, erected by Fontana.

		ft.	in.
Whole height	about	116	0
Without base, &c.	about	78	5·8

Hieroglyphics; broken in three places.

V.—Innocent X., 1651.

In the Piazza Navona; sometimes called the Pamphilian obelisk.

		ft.	in.
Whole height	about	99	0
Without base, &c.		54	3·3?

Hieroglyphics; fountain round the base.

VI.—Alexander VII., 1667.

Minerveo della Minerva, erected by Bernini.

This obelisk, with singular bad taste, is placed on the back of a horrible elephant, the work of Bernini.

		ft.	in.
Whole height	about	39	7·5
Without base, &c.	about	17	0?

Hieroglypnics.

VII.—Clement XI., 1711.

Mahuteo della Rotonda, in front of the Pantheon of Agrippa.

		ft.	in.
Whole height		47	8
Ditto without base, &c		19	8·85?

Hieroglyphics; probably the pendant of No. 6: Fountain round the base.

VIII.—Pius VI., 1786.

Quirinale di Monte Cavallo, erected by Antinori.

		ft.	in.
Whole height		94	11·86
Without base, &c.		47	8?

No hieroglyphics; appears broken in two or three places.—Zoëga, pl. 6.

IX.—Pius VI., 1789.

Sallustiano della Trinità di Monte, erected by Antinori.

		ft.	in.
Whole height		99	11
Ditto without base, &c.	about	43	6

Hieroglyphics.—Zoëga, pl. 7.

X.—Pius VI., 1792.

Campense di Monte Citorio, by Antinori.

		ft.	in.
Whole height		110	0
Ditto without base, &c.		71	6

Hieroglyphics.—Zoëga, pl. 8.

XI.—Pius VII., 1822.

Aureliano della Passeggiata, on the Monte Pincio.

		ft.	in.
Whole height		56	7·8
Ditto without base, &c.		30	0·9

Hieroglyphics. This is called by Zoëga the Barberini obelisk, of which he says, 'Hic e Romanis obeliscis adhuc cognitis solus expectat sospitatorem.'

XII.—1817.

Private obelisk on the Cœlian Hill, in the gardens of the Villa Mattei; hardly worth mentioning. It is a small fragment of a real obelisk mounted on a piece of modern granite.

In the present century, the labour of bringing away and re-erecting an obelisk nearly equal to some of the largest removed by the Romans has been accomplished by the French. It is the smaller of the two which stood before the propylon of the temple at Luxor, and is about 76 feet high and 8 feet wide on the broader sides of its base. Permission for the removal of both the obelisks having been granted to the French government by the viceroy of Egypt, a vessel constructed for the purpose was sent out in March, 1831, under M. Lebas, an engineer, to whom the undertaking was confided, it being previously determined to bring away only one. After three months' labour with eight hundred men, an inclined plane was formed from the obelisk to the river, where the vessel lay; and having been first carefully encased by planks to secure it from injury, the monolith was lowered by nearly the same process afterwards employed for raising it again on its pedestal at Paris, where it safely arrived, up the Seine, December 23, 1833, and was deposited near the Pont de la Concorde. Nearly three years however elapsed before it was elevated in the centre of the Place de la Concorde, which delay was partly occasioned by its being necessary first to construct a pedestal of as massive materials as could be procured. Blocks of granite were accordingly fetched from Brittany, the largest of which, forming the die of the pedestal, is 10 feet square by 16 in height. An inclined plane leading from the river up to a platform of rough masonry level with the top of the pedestal was then formed, and the obelisk, having been placed on a kind of timber car or sledge, was dragged up by means of ropes and capstans. One edge of its base having been brought to the edge of the pedestal, it was reared perpendicularly by ropes and pulleys attached to the heads of ten

masts, five on each side, and within about three hours the operations were completed, under the direction of Lebas, October 25, 1836.

Some few years ago the project was entertained of bringing over to this country and erecting in our own metropolis the monolith called Cleopatra's Needle, one of the two granite obelisks at Alexandria, which is still standing, the other being on the ground. Including the pedestal, the entire height is about 79 feet, but the monolith itself does not exceed 63 feet, and is therefore smaller than the Luxor obelisk at Paris. The idea of removing it hither seems now however to be quite abandoned.

The largest Egyptian obelisk hitherto brought over to this country is that which was removed from the island of Philæ by Belzoni, and which is now erected at Kingston Hall, Dorsetshire, the seat of W. J. Bankes, Esq. It is a monolith of red Egyptian granite, 22 feet 1 inch in length, and its larger end, or base, 2 feet 2 inches square, the other being 1 foot 5½ inches.

Before the cathedral of Catania in Sicily is a small obelisk, said to be Egyptian, which is remarkable on account of its being not square but polygonal, and also for being placed on the back of an elephant raised on a lofty pedestal.

In the article AXUM a drawing is given of an obelisk which differs somewhat from the genuine obelisk in form; but it will serve, together with that given in the article ARLES, which stands on an appropriate pedestal, to give an idea of the general appearance of one of these monuments on a large scale.

For further particulars the reader may consult the great work of Zoëga, Champollion, and the 'Egyptian Antiquities,' in the *Library of Entertaining Knowledge*, vol. i.

OBERLIN, JEREMIAH JAMES, was born at Strasburg on the 7th of August, 1735, and was educated at the gymnasium of that town. He afterwards spent a few months at Montbéliard for the purpose of learning the French language, and returned to Strasburg in 1750, where he prosecuted his university studies. He took the degree of Doctor of Philosophy in 1758, and afterwards paid considerable attention to the study of theology. In 1768 he was appointed a teacher in the gymnasium where he had been educated, and in 1763 was entrusted with the care of the library of the university of Strasburg, and obtained permission to give lectures on the Latin language. In 1770 he was appointed Professor of Rhetoric, and from this time was accustomed to give lectures on Greek and Roman archæology, antient geography, &c. In 1778 he was appointed Extraordinary Professor in the university, in 1782 Ordinary Professor of Logic and Metaphysics, and in 1787 Director of the Gymnasium. During the Revolution his life was in considerable danger. He was imprisoned at the beginning of November, 1793, but obtained his liberty at the end of a few months; and again resumed his lectures at Strasburg, which he continued till his death, which took place on the 10th of October, 1806.

Oberlin was an accurate and industrious scholar. He published good editions of several of the Latin classics, of which his Tacitus and Cæsar are considered the most valuable. He had also paid great attention to the study of the antient French language, and travelled more than once through some of the provinces of France in order to become acquainted with the different patois spoken in the country. He published several works on this subject, of which the most important are, 'Observations concernant le Patois et les Mœurs des Gens de la Campagne,' Strasb., 1791; and 'Essai sur le Patois Lorraine des Environs du Comté du Ban de la Roche,' 1775.

Oberlin was also the author of several other works, the principal of which are,—'Dissertatio Philologica de Veterum Ritu condiendi Mortuos,' 1757; 'Rituum Romanorum Tabulæ in usum Auditorum,' 1774, reprinted in 1784; 'Jungendorum Marium Fluviorumque omnis ævi Molimina,' 1770-1776; and 'Dissertations sur les Minnesingers' (the Troubadours of Alsace), 1782-1789.

The life of Oberlin has been written by Schweighäuser in Latin, and by Winckler in the *Magas. Encycloped.*, 1807.

OBERLIN, JEAN FREDERIC, Protestant pastor in the Ban de la Roche, and younger brother of the philologist Jeremiah James Oberlin, was born at Strasburg on the 31st of August, 1740. His education was conducted with the greatest care by his intelligent and pious parents, and while yet a child he gave striking indications of the benevolence and self-denial which were afterwards so conspicuous in his conduct. He had a strong taste for the military profession; but as it was his father's desire that he should devote himself to one of the learned professions, he pursued his studies at the university of Strasburg and received holy orders. While he was at the university, the preaching of Dr. Lorentz make a powerful impression on his mind, and he has left behind him a record of his strong religious feelings in a solemn dedication of himself to God, similar to that recommended by Doddridge in his 'Rise and Progress,' which is dated 'Strasburg, the 1st of January, 1760: renewed at Waldbach, the 1st of January, 1770.' He remained without a pastoral engagement for some years after his ordination (from 1760 to 1767), and during this period he was private tutor in the family of M. Ziegenhagen, an eminent surgeon at Strasburg. In the year 1766 he had just accepted the offer of a chaplainship to a French regiment, when he was invited by M. Stouber to succeed him as pastor of the Ban de la Roche. This post afforded to Oberlin the very opportunity which he longed for, to devote all his powers to the good of his fellow-men, and he therefore at once accepted it, and arrived at Waldbach to enter on his duties on the 30th of March, 1767.

The Ban de la Roche, or, as it is called in German, the Steinthal (valley of stone), was part of the former province of Alsace, in the north-east of France: it is situated on the western slope of the Haut Champ, or Champ de Feu, a range of mountains to the east of the Vosges, from which chain it is divided by a deep valley. The Ban contains two parishes, one of which is Rothau, and the other consists of the five hamlets of Foudai, Belmont, Waldbach, Bellefosse, and Zolbach. Nearly all the inhabitants of these hamlets are Lutherans. The soil is sterile, and nearly half of the land is covered with wood. The district was laid waste in the Thirty Years' War, and again in the time of Louis XIV.; so that in the middle of the eighteenth century it afforded a bare subsistence to some eighty or a hundred families, who were in a state little removed from barbarism, but who possessed one blessing of which all France except Alsace was deprived, namely, religious liberty, which had been guaranteed to the province of Alsace when it was united with France. In the year 1750 M. Stouber became pastor of this district, and succeeded by great exertions in establishing efficient schools, and in distributing Bibles through the parish, where they had been so scarce before, that the former minister had not possessed a copy. Stouber removed to Strasburg in 1767, after finding in Oberlin a successor well qualified to carry on the work he had begun. Notwithstanding all Stouber's exertions, Oberlin found his parish in a wretched state, and a large party in it obstinately prejudiced against any improvement, and prepared to oppose all his plans. It was only by his great decision and mildness that he escaped personal violence on one or two occasions soon after his arrival. From the moment he set foot in his parish he directed all his energies and learning to the civilization and religious improvement of his people. His first object was to bring them into communication with their better instructed neighbours, from whom they were entirely cut off by the want of roads. He assembled the people, and proposed to them to make a road to Strasburg by blasting the rocks and building a bridge across the river Bruche at Rothau. The peasants with one voice declared the thing to be impossible. Oberlin reasoned with them in vain. At length he took up a pickaxe, and, inviting all who saw the importance of his plan to follow him, he set to work with his own hands. The peasants at once joined him, and by their efforts, assisted by the contributions of Oberlin's friends, the road was made and the bridge built by the beginning of the year 1770. The results which Oberlin had foreseen soon followed. The people could now dispose of their produce and supply their wants; agricultural implements were imported; and several young men from his parish were apprenticed in Strasburg to the most useful mechanical trades, which were thus introduced into the Steinthal. Oberlin next turned his attention to the agriculture of the district, which was in the worst possible state; but he found his people little disposed to be taught their own art by one brought up in a town. He appealed, as before, to their senses, by planting with fruit-trees two large gardens belonging to the pastor's house, which were crossed by public footpaths. His trees flourished; the people came to him to beg for slips and to learn the art of rearing them; and in a few years the desolate cottages of the Ban de la Roche were surrounded with neat orchards.

The potatoes, which were the principal food of the people, had so degenerated, that some fields only yielded about one-third of their former crop. The people blamed the land; but Oberlin procured new seed; and as the soil of the mountains was well adapted to the culture of the potato, abundant crops, and of a very superior quality, were soon obtained. He also introduced the culture of flax and Dutch clover, taught the people the value of manure, persuaded them to convert a great quantity of pasturage into arable land, and established an agricultural society and a fund for the distribution of prizes to the farmers.

Oberlin was no less zealous in promoting education in his parish. He procured the erection of a new school-house at Waldbach in place of the log-hut built by Stouber, which had fallen to decay; and in a few years a new school-house was built in each of the other four hamlets. To him also belongs the honour of being the founder of infant-schools, which he established in each commune, placing them under the management of conductresses paid at his own expense. In these schools the children were not allowed to speak a word of patois. In the higher schools the subjects taught were reading, writing, arithmetic, geography, the principles of agriculture, astronomy, and sacred and profane history. Oberlin carefully superintended all the schools, and reserved the religious instruction almost entirely to himself. He made great efforts to supply the people with suitable books, some of which were printed at his own expense: among these was an almanac which he drew up for the use of his parishioners.

None of these schemes for the worldly advantage of his flock ever diverted Oberlin from his peculiar duties as their religious teacher. He constantly laboured to impress upon them that they must do everything from religious principle, and even the planting of trees and the repairing of a road were represented by him as works which were to be performed from love to God, who has commanded us to live for each other's welfare, and from love to Christ, who spent his life in doing good. So far did he carry this mode of connecting faith and good works, that he required of all young persons applying for confirmation a certificate from their parents of their having planted two trees. His preaching was simple, impressive, and affectionate, well adapted to the minds of his people, and perfectly orthodox. In the year 1782 he founded a Christian Society for the religious improvement of his flock; and dissolved it in 1783, on account of the opposition it met with from some, whom his gentle spirit did not wish to offend. His own conduct was always influenced by the most sincere piety, and by a strong practical faith in a superintending Providence. This faith he carried so far, that he used to keep by him slips of paper with the words *Oui* and *Non* written on them, with which he drew lots whenever he found himself unable to decide which of two courses to pursue, believing that 'the lot is cast into the lap, but the whole disposing thereof is of the Lord.' (*Prov.*, xvi. 33.) At the time of the French Revolution, the Ban de la Roche was not only secured from molestation by the well-known character of the people and their pastor, but Oberlin was even able to afford an asylum to several proscribed persons. Once indeed he was cited before the supreme tribunal of Alsace on a political charge, when he was not only acquitted, but received an assurance from the court of their deep regret that he should have been called from the scene of his labours. In 1795 he renounced his stipend on account of the poverty of his people, leaving each of them to contribute what they could to his support. His economy was as strict as his benevolence was extensive. He was never known to owe a single sous; and he made it a point of conscience to set apart for religious and charitable purposes the three tithes required of the Jews by the Mosaic law. He was a warm supporter of the Missionary Society, and the first foreign correspondent of the British and Foreign Bible Society. When the assignats were issued by the French revolutionary government, he soon foresaw their depreciation, and began to buy them up from his people to prevent them losing by them: in the space of twenty-five years he succeeded in redeeming all that had been brought into the Ban de la Roche.

Among the employments which Oberlin found for his people were straw-plaiting, knitting, dyeing with the plants of the country, and weaving. About the year 1813 the industry of the district received a fortunate stimulus through the introduction of the ribbon manufactory by M. Legrand, formerly a director of the Helvetic Republic, who was induced by his esteem for Oberlin's character to remove with his two sons from Basle to the Ban de la Roche. In this family Oberlin found faithful friends and able assistants in his plans of usefulness.

Among the old evils under which the Ban de la Roche had suffered, one of the greatest was the remains of the feudal system, out of which had arisen a ruinous law-suit between the peasantry and the seigneurs respecting the right to the extensive forests of the district. Oberlin persuaded the parties to come to an agreement, and the pen with which that agreement was signed was solemnly presented to him by the maires of the district on the 6th of June, 1813. Nor was this the only civic honour he received, for Louis XVIII. presented him with the decoration of the Legion of Honour as an acknowledgement of the services which he had rendered to a numerous population; and in 1818 he received a gold medal from the Royal and Central Agricultural Society of Paris. His Memoirs contain accounts written by several persons, of very different characters and pursuits, of visits to the Ban de la Roche during Oberlin's life, and all of them bear witness to the astonishing results of his labours, as shown by the intelligence and piety, the politeness and hospitality, the industry, benevolence, and happiness of the people whom he had found wretched, ignorant, and half-savage. Those readers who wish further information as to his character, habits, and personal appearance, are referred to the work mentioned below.

Oberlin died on the 1st of June, 1826, in the 86th year of his age and the 59th of his residence in the Ban de la Roche. He was buried at Foudai on the 5th of June. Nearly all his flock followed their *Cher Papa*, as they always called him, to the grave, and several Roman Catholic priests, with all the Protestant clergy in the neighbourhood, joined in the funeral rites. An affectionate parting address to his people, which he had left behind him, was read from the pulpit on the occasion.

Oberlin was married on the 6th July, 1768, to Madeleine Salomé Witter, who died on the 18th January, 1784. He had nine children, two of whom died very young. The other seven were brought up under his own care, and lived to help him in his labours. Their names were—Fréderic, who died in 1793; Fidelité Caroline, who was married in 1795 to the Rev. James Wolff, of Mittelbergheim, and died in 1809; Charles Conservé, who became in 1806 pastor of Rothau, in the Ban de la Roche, where he still resided in 1838; Louisa Charité; Henrietta, married to the Rev. M. Graff; and Frederica Bienvenue, married to the Rev. M. Rauscher. Oberlin was succeeded by his son-in-law, M. Graff, who had been his assistant for some time: but he was soon obliged to remove to Strasburg on account of ill health, and was succeeded by M. Rauscher, the present pastor.

(*Memoirs of John Frederic Oberlin*, 8th edit., *with a Short Notice of Louisa Schepler*, London, 1838. The 2nd edition of this work was reviewed in the 'Journal of Education,' vol. i., p. 362.)

Any account of Oberlin's life would be incomplete without some notice of LOUISA SCHEPLER, who was originally his servant and a conductress in one of his schools. Upon the death of Oberlin's wife she became his housekeeper, and soon after she begged him to pay her no more wages, but to treat her as one of his children. Her request was complied with, and she lived in Oberlin's family till and after his death, employing all her energies and the whole of a little property which she possessed in works of benevolence. In August, 1829, she received one of the *Prix de Vertu* distributed annually by the Académie Française, amounting to 5000 francs, the whole of which she laid out in assisting the poor and in other benevolent objects. She died on the 25th of July, 1837, at the age of 76, having been a conductress 58 years.

OBESITY is an excessive accumulation of fat in various parts of the body. It is not possible to define the boundary beyond which the fat in the body can be called excessive, for persons possessing it in the most varied degrees enjoy equally good health, and the same person may at different times possess more or less without any injury to his comfort. The average quantity of fat in healthy men is from $\frac{1}{20}$ to $\frac{1}{8}$ of the weight of the whole body.

Obesity may occur at all ages; it is not uncommon in children; is far more rare in youth and in the early periods of manhood; and is most common after the age of 40, at which time an increase in the quantity of fat is observed in perhaps the majority of persons.

The chief accumulations of fat take place beneath the muscles, in the omentum and mesentery, about the heart, on the chest, and under the chin. In all these parts a certain quantity of fat naturally exists, and here therefore its amount is merely increased; but in cases of excessive obesity, it accumulates in situations where before there was none, as among the minute fibres of the muscles even of the heart, and in various other tissues.

The common effects or accompaniments of excessive fatness are sleepiness and heaviness, indisposition or incapacity for active exertion, shortness of breath, a weak action of the heart, and a general torpor of all the functions of the body. It predisposes to various congestive diseases, as apoplexy, &c.

The remedies for obesity are unfortunately not so well known or so efficacious as the modes of producing it. Perfect quietude, a bountiful supply of nutritious food, and long sleep are the means by which the grazier rarely fails to produce obesity in his cattle: and it is in general found that a plan exactly the reverse of this is the most successful means of relieving men from the same condition. Dr. Radcliffe's brief advice 'to keep the eyes open and the mouth shut' embodies nearly all the curative means for this disorder. A small quantity of food, and that of the least nutritive kind, active exercise both of body and mind, diminished quantity of sleep, an avoidance of all indulgence, and the maintenance of the various secretions in at least their natural quantity, are the only means that can be employed with the least prospect of benefit. It is true these are often insufficient, but they should still be persevered in to prevent the malady from growing worse, an evil which the opposite course will undoubtedly ensure.

OBI'DOS, a small town of Portuguese Estremadura, situated near a lagoon which communicates with the sea, about 50 miles north of Lisbon, and on the west side of the ridge which crosses the country from north to south. This place has become memorable in the history of our own times through the battle which took place near it on the 17th August, 1808, between the English, commanded by Sir Arthur Wellesley, who was advancing from Mondego Bay, where he had landed about a fortnight before, and the French, commanded by General Delaborde. The English attacked and drove the French from their position with the loss of six hundred men. The French general fell back upon Torres Vedras, where he was joined by Junot, who soon after fought the battle of Vimeiro with a similar result. The battle of Obidos was the first of a long series of engagements between the English and the French in the Spanish Peninsula, which continued till 1814.

OBJECT GLASS. [TELESCOPE.]

OBLATE, a term applied to a spheroid which is made by the revolution of an ellipse about the smaller of the two axes.

OBLIQUE. This term is used as opposed to direct or right, and signifies whatever is not direct or right. The word seldom appears, except as expressing that an angle is not a right angle, all other uses of it being almost obsolete.

OBLIQUITY, a term used in astronomy to express the angle made by the ecliptic with the equator. The greatest latitude at which the sun ever appears vertical is the obliquity of the ecliptic. [SUN; PRECESSION AND NUTATION.]

OBLONG, a word in common use, expressing the same meaning as, and in our opinion preferable to, the mathematical term rectangular, or having the figure of a rectangle.

OBOE (*Ital.*), a musical instrument of the pneumatic kind, blown through a reed: it is a tube of boxwood, 22 inches in length, slender in the upper part, but spreads out conically at the lower end, and consists of three joints, or pieces, besides the reed. Its compass is two octaves and a fifth, from C below the treble clef, to G, the fourth added line above it:—



Modern improvements have augmented the resources of the Oboe by means of eleven keys, but only skilful performers can safely be trusted to produce the two or three highest notes; and till very recently, E, or even C, above the staff, was considered the utmost practicable extent of the instrument. Oboes are now frequently made to go down to B ♭, in which case they exceed the usual length, and have an additional key.

The Oboe has for centuries past been in use, and may be traced back to the reign of Edward III., in whose band oboes, under the denomination of *Waughtes*, were employed. Indeed our itinerant parish-musicians, the official precursors of what was once a merry season, retain the appellation of *Waits*, though they have long abandoned the instruments which conferred on them their title.

Up to nearly the close of the last century, this instrument was only known, in most parts of Europe, by its French name, *Hautbois*, a word which in England has always been pronounced *Hoboy*; and this pronunciation has been transferred to the Italian term, through the word Oboe is now invariably adopted in writing.

O'BOLUS (ὀβολός), was a Greek coin, both silver and brass. At Athens it was of silver, the sixth part of a drachma, and worth somewhat more than five farthings sterling. The Æginetan obolus is stated to have been heavier than the Athenian. It is generally supposed that *óbolos* and *óbelos* (ὀβολός and ὀβελός) were originally the same word differently pronounced [OBELISK], and that the coin *obolus* was first of iron or copper, in form like a spit, which the word also means, or a bar; that a handful made a *drachme* (δραχμή); and that the form was afterwards changed from an oblong to a round shape, but that though struck round, like other money, it continued to retain the antient name. Others say that the obolus was originally so called from being stamped with the figure of a skewer or spit, or other sharp-pointed instrument.

At a later period the obolus was of brass. Eckhel (*Doctrina Num. Vet.*, tom. i., p. 156) mentions a brass coin of Metapontum, which on the reverse bears the word ΟΒΟΛΟΣ. This coin, which is in the Imperial cabinet at Vienna, is engraved by Motraye (*Voyage*, tom. ii., tab. 7, n. 40). Pitiscus notices a similar coin bearing the same word, struck by the Nicæans. Wise, in the *Nummi Bodleiani*, in his 'Notæ in Nummos Populorum,' p. 134 a, observes that the Chians designated their brass coin by the same term; 'Chii monetæ suæ æreæ valorem nominatim designabant, ut ΟΒΟΛΟΣ, *obolus*.' The small silver coin of Athens, bearing on one side two bodies of an owl rising into one head, is supposed to be the obolus. There are small brass coins of Athens also of the same type.

The Greeks had an hemi-obólion (ἡμιωβόλιον), or semi-obolus, and a *trióbolon* (τριώβολον), or silver coin of three oboli, which was the common pay of the Dicastæ; the pay originally having been two oboli. Two *oboli* were placed in the mouth of a dead person, in order to enable him to pay for his passage over Styx. According to Lucian, Charon's demand was only one obolus. (Aristoph., *Frogs*, 141; Lucian, *Catapl.*, i., p. 643.)

According to Suidas (ὀβολός), the Athenian *obolus* contained six *chalci* (χαλκοί), and the *chalcus* contained seven *lepta* (λεπτά). Other authorities say that the *obolus* contained eight *chalci*.

(Julii Pollucis *Onomasticon*; Pitisci *Lex. Antiq. Rom.*, Rasche, *Lexicon Rei Nummariæ*, tom. iii., p. 2, 32; Boeckh's *Public Economy of Athens*, i. 132; ii. 386, Engl. tr.)

OBSERVANTS, Friars, a branch of the Franciscans. Some considerable relaxation having been gradually effected in the rule of the Franciscan order, it was thought requisite, as nearly as possible, to restore it to its first rule and original institution; whereupon such as continued under the relaxed order were called Conventuals, and such as accepted the reformation were called *Observants*, or Recollects. This reformation was begun about A.D. 1400, by St. Bernard, or Bernardin, of Siena, was confirmed by the Council of Constance, A.D. 1414, and afterwards by Eugenius IV. and other popes.

The Observants were brought into England by king Edward IV., who allowed them to fix their first residence at Greenwich. King Henry VII., by his charter bearing date 1486, after reciting that his predecessor, king Edward IV., had, by the pope's licence, given to certain Minorites, or Observant Friars of the Order of St. Francis, a piece of ground adjoining to his palace there, on which were some antient buildings, and that these friars having taken possession, and having laid the first stone with great solemnity, begun to build several small mansions in honour of the

Virgin Mary, St. Francis, and all Saints granted and confirmed the said premises, and founded a convent of friars of the Order above described, to consist of a warden and twelve brethren at the least. (*Cart.*, 1 Henry VII., n. 24.) It is said that he afterwards rebuilt their convent for them from the foundation. (*Hist of the Eng. Franciscans*, p. 216.)

Catharine of Aragon, the first wife of Henry VIII., was a great favourer of this convent and their order. She appointed one of the friars of Greenwich, father John Forrest, to be her confessor; and while she was resident at this place, she used to rise at midnight and join the friars in their devotions. The friars were grateful, and openly maintained her cause when the subject of the divorce was agitated. The king was so much irritated by this conduct, that he suppressed the Order altogether.

The convent at Greenwich was suppressed August 11, 1534. On the accession of queen Mary to the throne however, the Observant friars appeared again in public, and returning to Greenwich, began to form themselves into a community. The queen reinstated them in their possessions, founded their monastery anew, and repaired it at her own cost, out of gratitude for their fidelity to her mother. Queen Elizabeth expelled the friars, and suppressed their monastery again, on June 12th, 1559.

(Tanner, *Notit. Monast.*, edit. Nasm., p. xiii.; *History of the English Franciscans*, ut supr.; Stevens's *Contin. of Dugd. Monast.*; Lysons's *Environs of London*, ed. 1811, vol. i, pp. 527, 528.)

OBSERVATION AND EXPERIMENT. The first of these terms includes a portion of the second, inasmuch as every experiment is made with a view of observing the result. But the latter signifies more than the former, implying a disposition of means of observation which it is in the power of the experimenter to make for himself, and which he actually did make for himself. If, for example, a person who observed the attraction of the magnet for the first time, dubious of the residence of the attracting power, were to move the magnet to another place, that he might see whether the attracted body would still move towards it, he would make an experiment. But if his magnet were the sun and the attracted body the earth, he could only wait the proper times for observing the motion of the latter with respect to the former, in order to establish the attraction. Thus astronomy, geology, meteorology, natural history, &c. are sciences of observation (that is, of nothing but observation); while mechanics, optics, electricity, &c. are sciences of experiment. In one sense geology and meteorology are partly sciences of experiment, since portions of the material subject-matters of these sciences may be submitted to preconcerted tests. It would however be more proper to consider mineralogy and aero-mechanics as the experimental sciences connected with these, than to class them as mixed sciences.

To give an account of experiment would require us to explain the methods of every science which proceeds upon it: to give a detailed account of observation, we should need the description of all the means or instruments by which our senses are assisted in the examination of phenomena. We shall here confine ourselves to a short sketch of the errors which render observations discordant, and which make a final process of combination necessary in every case in which we cannot command results which agree with each other so well that the difference between them is imperceptible to the senses.

Everything which is called observation is of two kinds; in the first a simple individual fact is noted, in the second a magnitude is measured. The results of the first species are the proper subjects of inductive reasoning only; the results of the second, of inductive and mathematical reasoning, either or both. Individually, the first kind of observations are not necessarily subject to error: thus a zoologist observing the structure of a new animal might in every instance correctly note the resemblances which exist between it and other animals, and might refer it to its proper class in a manner which centuries of succeeding observation would not induce naturalists to disturb. Collectively however, wrong inferences might be drawn from facts; thus results of classification which are true of all animals known up to one moment, and are therefore inferred to be always true, may be disturbed in the next moment by the discovery of a new specimen.

Observations of the mathematical character are of necessity erroneous from the imperfections of our senses. When a new insect is observed, it is soon seen, for instance, whether it has or has not wings, and the question once settled is finally settled. But when, say the specific gravity of a gaseous substance, at a given pressure and temperature, is *measured*, it is impossible to consider the question as settled at any time. Say that, under given circumstances, the specific gravity is asserted to be ·934 of that of air similarly circumstanced; this is only an admission, at most, of its being somewhere between ·9335 and ·9345. And that which we call an exact measurement of a length may for one purpose mean within a hundredth of an inch, for another within a thousandth, and so on; but no person dreams of having attained absolute truth. This being well known, and every process used in observation being subject to error, it is the business of the observer to repeat observations many times, and to extract a result as near to the truth as may be, from the mass of discordant materials which the repetition will furnish.

The necessary errors of observation arise from the imperfection of our perceptions and of the instruments which we use, and also from hasty or otherwise incorrect conclusions. The subject requires the separation of these errors into three classes, which may be mixed up with one another in results, and may be mistaken for one another. We may call them *fixed*, *personal*, and *casual*.

By a *fixed* error we mean one which is inherent in the instrument or method employed, so that it must exist, and, all other things remaining the same, must have a given magnitude. Thus, if the axis of an equatorial (supposing such an instrument to be employed for absolute measurements) do not absolutely coincide with that of the heavens, the right ascension and declination of a given star, measured when at a given distance from the meridian, must have a given error. It might be precisely the same in numerical effect, and would certainly produce an error of the same class, if the observer used a wrong formula in the reduction of his observations. Thus, it would be perfectly possible to give to one observer an incorrect instrument and a correct formula, and to another a correct instrument and an incorrect formula, in such manner that their final results should coincide.

Errors of this kind cannot be detected by multiplying similar observations, since there can be no tendency to destroy error in the mere repetition of it. There are many modes of detecting fixed errors, and of allowing for them; but the only mode of avoiding them is by taking advantage of the construction of the instrument to use it for the same purpose under different circumstances, in such manner that measurements which are too large in one set of results must be as much too small in the other. If the same number of observations be contained in each set, this, as we shall presently see, is really a reduction of the fixed error to the class of casual ones; or rather, a destruction of the fixed error by the same process which gives the highest probability of destroying the casual errors.

All instruments must be more or less erroneous in every particular. In the science of observation, as now understood, and in any matter in which the utmost attainable exactness is requisite, the assumption of perfection in an instrument, in any point whatsoever, is looked upon as nothing but the expression of the observer's unwillingness to take trouble. For even if ninety-nine successive days' trials have shown that any particular error does not exist to any sensible amount, it is not conclusive against the observations of the hundredth day being affected by some new circumstance, necessary or accidental, in which the instrument has been placed in the intermediate time.

By a *personal* error is meant one of the same character as a fixed error, but arising from the temperament or habits of the observer, and not from the instrument. Thus if A should, in noting the time of a phenomenon by the clock, have a tendency to accelerate the moment of its happening, and B a similar tendency to retard it, the results of the two would differ by the sum of their personal errors. It is only lately that it has been discovered that two individuals, observing the same phenomenon with the same species of instruments, may differ sensibly (though but little) from each other; and this not once or twice, but nearly always, and in such a manner as to make the average of a set of observations of one observer differ from that of the other. For anything we can know to the contrary, this species of error may exist in every observer; and its absolute quantity must be unknown until we can compare the observa-

tions of men subject to it with those of some other beings who are not. If indeed the personal error is purely casual, so that where one person measures too much, another measures as much too little, the average of the results of a large number of observers would give the truth or very near it. But should it be the case, which is not impossible, that all men are subject to an error of the same kind, some more and some less, namely, that all measure more or less too much, or else that all measure more or less too little, the average above mentioned would give, not the truth, but the truth affected by the average error of all the observers. Nor would the results obtained ever enable us to distinguish whether personal errors have a fixed average or not; for suppose the fact observed to be that A, one time with another, measures more than B; this *may* mean either of several things:—either A measures truly, and B too little; or B measures truly, and A too much; or B measures too little, and A too much; or both measure too little, but B more than A; or both measure too much, but A more than B. Now, if A and B were to observe together for a century, the mere comparison of their observations, though it would settle their average amount of difference, would never enable us to give the least guess which of the preceding cases is the true one. If indeed we could convert the observer, as we have previously mentioned might generally be done with the instrument, into another observer with an error of the opposite kind, a true result, or one sensibly true, might be obtained. Suppose, for example, it is the observer's habit, in noting the transit of a star over a fixed wire in the field of a telescope, to take the transit too soon when the star comes in on the right side, and too late when on the left: consequently, by making a number of observations with an inverting telescope, and an equal number with one which does not invert, the average of both sets would be as likely to give a true result as if neither error had existed.

All the errors which precede, though called errors because they give a result which is not the one intended to be obtained, yet are in fact the consequences of an actually existing state of things, and their laws can be determined by using the right means, or at least must be supposed to arise from natural causes determinable by experiment in the same manner as other consequences of existing relations. They are then really measures of phenomena, called errors simply because the effects of their causes are to be removed from the results. It is even possible that they might be made intentionally in a given form, with a view to prevent their occurrence in a more objectionable form. Thus, suppose an observer finds himself, in correcting discordant observations, apt to confound additions and subtractions, using one for the other: he will set his instrument intentionally wrong to an amount which casual discordances never reach, taking care, of course, to preserve means of correcting the intentional error with the rest; so that the requisite correction shall always be of one kind, additive or subtractive. Nevertheless this arrangement, as it should be called, would go by the name of an error, simply as being to have its effect afterwards destroyed.

By *casual* errors, the only ones to which the name of errors can properly be given, are meant those which are absolutely inexplicable, or of which the cause and tendency are equally unknown. They must be considered as equally likely to be positive or negative; so that in the long run the results which they give too great will be compensated by those which are too small. If this be not the case, that is, if there be a greater tendency to too much than to too little, there must be a reason for this phenomenon, and a law of action, which must be sought for and detected. Let us suppose this done, so that any result of a single observation, corrected for all discoverable sources of error, is in itself as likely to be too small as too great.

If all the observations be equally good, the MEAN, or average, is more likely to be true than anything else. This is even true with reference to fixed or personal errors which may remain, but which are totally unsuspected; for there is an even chance of such errors acting in either way. In the article just cited is shown the way of finding, from the observations themselves, the probable error, as it is called, or that which there is an even chance of not exceeding; with references to further sources of information. This article [MEAN], together with the general considerations in PROBABILITIES, THEORY OF, and WEIGHT OF OBSERVATIONS, will contain all we shall find it necessary to say on the subject.

It might be supposed that the greater the number of observations, the less, in the same proportion, the probable error of the average; but this is not true, since the probable error diminishes as the *square root* of the number of observations increases. Thus, suppose it to be well settled that twenty observations of a given observer will have an average of which it is an even chance that it does not err by (say) a unit: then the same observer must make *four* times as many observations to get an average with an even chance of not more than *half* a unit of error; *nine* times for one-*third* of a unit, and so on.

Those who neglect sound principles of observation are apt to overrate the effect of multiplying observations; which, though considerable, does not, as we see in the above rule, keep pace with the number of observations.

OBSERVATORY. [TRANSIT INSTRUMENT.]

OBSIDIAN (called by the Romans, *Obsidianus Lapis*; by the Greeks, Ὀψιανὸς λίθος), a mineral, probably of volcanic origin, and so called, as stated by Pliny (*Hist. Nat.*, xxxvi. 26) from a person named Obsidius, who first found it in Ethiopia. This substance occurs in beds, in large and rolled masses and in small grains. Its structure is compact. Fracture large, conchoidal. Hardness 6·0 to 7·0. Scratches glass. Brittle. Colour greenish, greyish, or brownish black. Lustre vitreous. Opaque. Translucent on the edges. Specific gravity 2·34 to 2·39.

Obsidian in the form of little grains of the size of peas, and of a pearly white colour, and consisting of very thin concentric layers, has been found at Marekan in the Gulf of Kamtchatka. It has been called *Marekanite*.

Pliny says that gems and sometimes whole statues were made of obsidian: he also speaks of four elephants of obsidian which were dedicated by Augustus in the temple of Concord. Statues were also made of it by the Egyptians.

Before the blow-pipe, it swells up strongly, and fuses into a transparent glass. It occurs in veins and beds traversing rocks in many parts of Europe, Asia, and America, and in the neighbourhood of most volcanoes.

The analyses of different varieties of obsidian differ considerably: the following analyses of Marekanite and of Obsidian from Cerro de las Navagas, are by Klaproth and Vauquelin respectively:

	Marekanite.	Obsidian.
Silica . .	77·50	78
Alumina . .	11·75	10
Soda } . .	7·00	
Potash } . .		6
Oxide of Iron .	1·25	3·6
Lime . . .	0·50	1
Water . .	0·50	
	98·5	98·6

OBTUSE, opposed to acute, is applied to an angle which is greater than one right angle and less than two.

OBY, River. [SIBERIA.]

OCAÑA, a town of Spain, in the province of New Castile, not far from Aranjuez, and about 30 miles south of Madrid, situated on the high road to Andalusia. On the 19th November, 1819, the Spanish army of Andalusia, about 50,000 strong, commanded by General Areizaga, advanced to Ocaña, and threatened Madrid, which was occupied by the French. The French under Marshal Soult attacked the Spaniards, who fought with great courage, especially the infantry, and at first repulsed the enemy; but after three hours' fighting, the French succeeded in breaking through the Spanish line, which dispersed in the greatest confusion leaving their cannon, baggage, and one half of their men killed or prisoners. Areizaga hurried away with the remainder of his army towards the Sierra Morena. The battle of Ocaña was a most disastrous event to the Spanish cause. The advance of the Spaniards upon Madrid had been effected against the advice of Lord Wellington, who was encamped near the frontiers of Portugal.

OCANA. [GRANADA, NEW.]

OCCAM, or OCKHAM, WILLIAM, an English scholastic philosopher, was born in the county of Surrey about the end of the thirteenth century. He was a pupil of Duns Scotus, 'the most subtle Doctor,' and, like his master, a member of the order of Franciscans. He himself attained to the title of the 'Invincible Doctor.' He opposed the Realism of Scotus and his followers, and formed a new speculative sect, bearing the name of Occamists, who revived

the tenets of Nominalism. In the early part of the fourteenth century, he taught at Paris. He was distinguished by his powerful opposition to the papal power. A book which he published, entitled 'De Potestate Ecclesiasticâ et Seculari,' drew down upon him the censure of the pope. He was protected by the king of France, whose cause he had supported against papal encroachments. When afterwards excommunicated by the pope, he found another friend in the emperor of Germany. He died at Munich, in 1347.

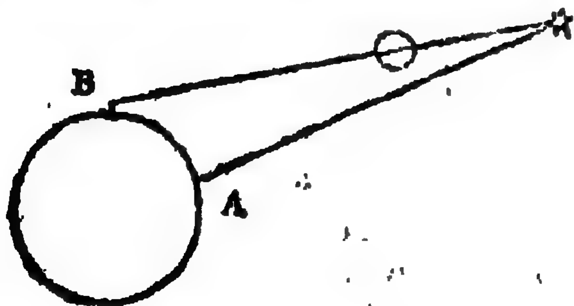
Very little is known of Occam's life. A list of his works, which includes a commentary upon the Predicables of Porphyry and the Categories of Aristotle, and many treatises of scholastic theology and ecclesiastical law, will be found in Fabricius's 'Bibliotheca Latina,' tom. iii., p. 466. Occam's *Summa totius Logicæ* was published at Paris in 1488, and at Oxford in 1675, 8vo.

Tennemann gives the following account of the Nominalist speculations of Occam:—'He maintained that general ideas had no objective reality out of the mind, because neither the possibility of judgments nor the possibility of a real science requires this hypothesis, and it only leads to absurd consequences. These general ideas have no objective existence but in the mind; they are a product of abstraction; and are either images (*figmenta*) which the mind creates for itself, or subjective qualities belonging to the mind, and which, according to their nature, are the signs of exterior objects. From this doctrine, roughly sketched only, the problem of the principle of individualization came to lose all interest, and the question of consciousness to occupy men exclusively. In the theory of consciousness, Occam diverged still more from the Realist opinion; and in maintaining the subjectivity of thought, he has perhaps given more encouragement than he meant to give to scepticism and empiricism.' (Tennemann, *Manuel de l'Histoire de la Philosophie*; Cousin.)

A few pertinent remarks on Occam and his philosophy are contained in Mr. Hallam's 'Introduction to the Literature of Europe,' vol. i., p. 233.

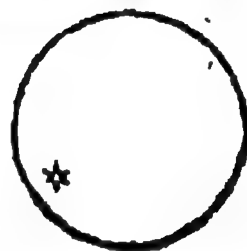
OCCULTATION. This word, which might serve to designate any eclipse of one heavenly body by another, and even the effect of cloud or fog, is particularly applied to the eclipse of a fixed star by the moon. It has been seen [MOON, p. 373] that the spiral course of the moon's real orbit must bring her at some time or other in the course of a revolution of the nodes ($18\frac{1}{2}$ years) at or near to every star situated within about 5° of the ecliptic either way. There are consequently continual occultations of stars by the moon; such of which as can be made useful in finding the longitude are given yearly in the Nautical Almanac.

If the moon were (like the star) so distant that two spectators at nearly opposite points of the earth would not be sensibly removed from each other in space when their distance from each other was compared with their common distance from the moon, then all observers, wheresoever situated, would see the moon begin to hide a star at the same instant. They would all then be able to note by their different clocks the absolute instant of the same phenomenon; and [LONGITUDE] their differences of clock-time at this absolute instant would give their differences of longitude. But the proximity of the moon makes it possible that one observer (at A) may see no occultation at the time when such a phenomenon has occurred to another (at B); and makes it certain that



two observers cannot see the beginning of an occultation at the same instant of absolute time. Both therefore must deduce from their own observed times of commencement, and from their knowledge of the moon's place and motions, the times, at their several places, at which a spectator situated at the earth's centre would see the star touch the moon's limb; and this being done, they are in the same position as if the moon had been too distant to require such a process. If, in this work, we had given the details of astronomical calculations, we should not have separated that required in reducing an occultation to the earth's centre from the similar case which occurs in an eclipse of the sun or a transit of Venus: the principles employed in all are identical, though the first process is rendered more simple than the second or third, by the very great distance of the star, which may be considered as marking the same point of the heavens at all places. For the value of observed occultations in finding the LONGITUDE, see vol. xiv p. 143.

Here we might close this article, if it were not for a singular circumstance which sometimes occurs; and which cannot be traced either to the character of the telescope employed, of the observer, of the weather during the observation, or of the particular star under occultation. When the moon approaches the star, instead of an instant of contact, followed by disappearance of the star, the latter for a few seconds is frequently thrown upon the moon, as if it were the nearer body, and were going to cross the moon's surface, as Venus does that of the sun during a transit. While this is taking place, which sometimes lasts until the star has fairly left the moon's limb or border, the star preserves it light, though it frequently undergoes a change of colour. Aldebaran, whose natural colour is inclining to



red, has been seen to present this phenomenon much more frequently than any other star: but θ Tauri, θ^1 and θ^2 Pleiadum, Spica Virginis, Regulus, γ Libræ, 132 Tauri, α^1 Cancri, 49 Libræ, λ Aquarii, 249 Aquarii, 187 Sagittarii, γ Tauri, ρ Leonis, ρ Geminorum, δ Cancri, δ Piscium, &c., have been seen more or less to come upon the moon's limb. See a detailed list of quotations from the different observers in a paper by Mr. South 'On the Occultation of δ Piscium by the Moon,' in the third volume of the *Memoirs of the Astronomical Society*. It is to be noted that many of these appearances did not exhibit the whole of the phenomenon, but made the star hang for some seconds upon the moon's limb, instead of immediately disappearing.

The occultations of Aldebaran approaching again in the years 1829 and 1830, the Society just mentioned invited the particular attention of astronomers to them. The consequence was, a large number of communications from different parts of Europe, which are printed in the fourth volume of their Memoirs. Nothing can be more different than the results: some, who had not seen the phenomenon before, saw it for the first time; others, who had seen it before, did not see it; some, who had never seen it before, continued unable to do so. Of six observers at the Royal Observatory, five distinctly saw the projection on the moon's limb, and one saw it hang on the edge of the moon five or six seconds before it disappeared. Of three at the Observatory of Paris, two distinctly saw the projection, and one saw the star disappear instantaneously, leaving a shade ('ombre') on the part of the moon at which it disappeared. The majority saw the star either projected or hanging on the moon's edge. It is to be noted that this phenomenon has been seen, though rarely, at the dark edge of the moon as well as at the enlightened. Its cause is matter of much diversity of opinion. Some suppose that the moon has an atmosphere close to the surface, which reflects the sun's light and appears opaque like the body of the moon, but is sufficiently transparent to allow the star to shine through it. Others think that certain telescopes give spurious disks to the moon, which inferior instruments certainly do: others again refer it to the eye of the spectator, and think that the impression produced by the star on the retina lasts a short time after the actual disappearance; and one observer states that he saw somewhat different phenomena, according as his attention was directed exclusively to the moon or the star. All these explanations have their difficulties, and are not given very positively. No one of them except that which refers the phenomenon to the eye of the observer will explain why it should sometimes happen and sometimes not, with the same observer and the same instrument; and it is obvious that by supposing a peculiarity of each individual retina for the time being, we do little more than make a purely arbitrary supposition, and one which would serve for any optical difficulty whatever. We need hardly add that no one imagines the star to come between the moon and ourselves.

OCCUPANCY. This term in English law signifies the taking possession by any person of any thing which has no owner (Bracton, *fol.* 8, *b*), and the general doctrine, as stated in Bracton, is derived from the Jus Gentium of the Roman lawyers, as explained in the *Digest* (lib. 41, tit. 1, s. 1, 3, 5, &c.). That use of the term which will be here explained has reference to the occupation of land.

An estate *pur auter vie*, or for the life of another person or persons, had formerly some peculiar qualities incident to it. If a man had an estate in land for his own life, such estate was of course determined by his death. But if he had an estate in land for the life of another person, and he or his assignee died before such person, the estate was not determined, and yet there was nobody to take it, inasmuch as it could not go to the heir, nor, being a freehold interest, to the executor or administrator. Such an estate belonged to the first person who could take possession of it, and he was entitled to hold it, as general occupant, till the expiration of the life for which it was originally granted. But if the original grant were to A and his heirs, for the life of B, and A died during the life of B, the heir of A took the estate as special occupant, that is, as a person designated in the original grant. Sometimes the heir was said to take the estate as a descendible freehold, though the estate is admitted not to be an estate of inheritance, and therefore not subject to courtesy or dower; it not being perceived that to say an estate is not an estate of inheritance and yet is descendible, is a contradiction, for descent implies an heir who takes as heir. Still it appears from Bracton (fol. 26 *b*, 62 *b*) that if lands were given to a man and his heirs for the life of another person, the heir could recover the land by an assise of *mort d'ancestor*, because the ancestor died seised as of fee, and a man could claim by an assise of mort d'ancestor any land of which his ancestor was seised as of a fee (ut de feodo); and hence it has been concluded that the heir took not as special occupant, but that he took a descendible freehold. This subject of occupancy, general and special, is discussed at great length and with considerable acuteness by Vaughan, Justice. (Vaughan, *Holden* v. *Smallbrooke*.)

In the case of copyhold, when there was no special occupant, the lord took the estate, for the lord, having the freehold, was also considered to have the possession; and therefore 'vacancy,' the necessary condition to any other person's title by occupation, was wanting. In the case of a rent or other incorporeal hereditament, when there was no special occupant, inasmuch as there could be no entry, there could of course be no possession or title by general occupancy.

It is stated by Bracton, that if land was given to a man for the life of another without any mention of his heirs, the land on the death of the donee did not immediately revert to the donor, unless the donee died intestate, or unless, though he made a will, he had made no mention of his interest in the land as of a term of years, but that if he had disposed of it in his will as of a chattel, such disposition was valid. (Bracton, fol. 27 *a*. See Doe dem. Blake, 6 *T. R.*, 291.) This power of disposing of a freehold interest in land must have fallen into disuse after the time of Bracton; for it is quite inconsistent with the doctrine of general occupancy as stated by Littleton, and also with the general rule of law, which prevented freehold interests in land from being disposed of by will, before the Statutes of Wills passed in the reign of Henry VIII. But the Statutes of Wills were limited to estates in fee simple, and no power to devise estates *pur auter vie* existed at law before it was given by the Statute of Frauds.

Since the passing of the Statute of Frauds (29 Car. II., c. 3) general occupancy (with perhaps one exception, hereafter mentioned) has ceased to exist. By that statute (s. 12) a man was enabled to devise an estate *pur auter vie* by a will in writing, executed as therein mentioned, and attested by three witnesses; and if no such devise thereof was made, the estate was chargeable in the hands of the heir, if it should come to him by reason of a special occupancy, as assets by descent, as in case of lands in fee-simple; and, in case there should be no special occupant thereof, it was declared that it should go to the executors or administrators of the party that had the estate thereof by virtue of the grant, and should be assets in their hands, that is, should be liable to the payment of the testator's or intestate's debts. By the 14 Geo. II., c. 20, s. 9, which recites 'that doubts had arisen, where no devise had been made of such estates, to whom the surplus of such estates, after the debts of such deceased owners thereof were fully satisfied, should belong:' it was enacted, 'That such estates *pur auter vie*, in case there was no special occupant thereof, of which no devise should have been made according to the said act (29 Car. II., c. 3), or so much thereof as should not have been devised, should go, be applied, and distributed, in the same manner as the personal estate of the testator or intestate.' These two statutes provided for the case both of a devise being made of an estate *pur auter vie*, and also for the case of the land coming to the heir as special occupant where no devise was made. But an estate *pur auter vie* may be limited either to a man and his heirs, or to a man, his executors and administrators, or to a man simply without mentioning either heirs, executors, or administrators. The Statute of Frauds appears to contemplate the heir only as special occupant, and if there was no devise according to the statute, and no special occupant, which would happen when the estate was limited simply to the grantee, the estate went to the executor or administrator for the payment of debts, and after payment of debts, the surplus was distributed, under the act of George II., in the same manner as the testator had directed the distribution of his personal estate, or it went, in case of an intestacy, to the next of kin of the intestate. But when no devise was made according to the statute, and the estate was limited to the grantee, his executors and administrators, inasmuch as the heir could not in that case be special occupant, the question arose, if the executor or administrator could be such occupant, and if he could, the further question arose, Who was to have the estate after payment of debts? The proper construction of the two statutes seemed to be that the heir only could be special occupant, and that he alone could take as such. If then the land were not devised according to the Statute of Frauds, and there was no special occupant, by reason of the limitation being simply to the grantee, or to him, his executors, and administrators, the executor or administrator would take it under the Statute of Frauds, and distribute it, after payment of debts, under the statute of George II. The executor or administrator took the estate as a freehold, which it is, but in trust for the persons entitled under a will, which was sufficient to pass personal estate, or, in case of intestacy, in trust for the next of kin. (See the opinions of Lord Redesdale, in *Campbell* v. *Sandys*, 1 Sch. and Lef., 288; and the opinions of Lord Eldon, in *Ripley* v. *Waterworth*, 7 Ve., 425.)

If a man dies intestate who is seised of an estate for another's life, and the limitation is such that the estate cannot go to his heir as special occupant, the estate seems open to a general occupancy until an administrator is appointed; but such administrator seems to have a title by relation.

Neither the Statute of Frauds nor that of George II. applied to copyholds, and therefore not to estates *pur auter vie* in copyhold lands.

Estates *pur auter vie*, whether there shall or shall not be any special occupant thereof, and whether the same shall be freehold, customary freehold, tenant right, customary or copyhold, or of any other tenure, and whether the same shall be a corporeal or incorporeal hereditament, are now devisable by a will in writing executed in the manner prescribed by the statute of 1 Vic., c. 26, which repeals, among other clauses, that part of the Statute of Frauds which relates to estates *pur auter vie*, and also the 9th section of 14 Geo. II., c. 20. And if no disposition by will is made of any estate *pur auter vie* of a freehold nature, the same shall be chargeable in the hands of the heir, if it shall come to him by reason of special occupancy, as assets by descent, as in the case of freehold land in fee simple; and in case there shall be no special occupant of any estate *pur auter vie*, it shall go to the executor or administrator; and if the same shall come to the executor or administrator either by reason of a special occupancy or by virtue of that act, it shall be assets in his hands, and shall go and be applied and distributed in the same manner as the personal estate of the testator or intestate. This statute settles a number of questions, some of which have been already referred to, which were of frequent occurrence, with respect to estates *pur auter vie*.

On the subject of Occupancy, the reader may consult Puffendorf, *Law of Nature and Nations*, iv., c. 6.

OCEAN (a Greek word, Oceanus, Ὠκεανός) is a term used to indicate the extensive bodies of salt-water which cover the greater part of the earth's surface. The word first occurs in Homer, who uses it to designate the river or

stream which, according to his ideas, surrounded the surface of the earth like a circle. The Greek geographers however knew that the ocean was a wide expanse of water, which surrounded the land, and the term ocean was used by them in this sense. They supposed that it penetrated deep into the mass of the continent by four great bays or seas: these were, on the south the Arabian Sea and the Persian Gulf; on the west the Mediterranean; and on the north an imaginary strait which connected the Northern Ocean with the Caspian Sea. (Strabo, p. 121; Pomp. Mela, i. 1.)

The proportion between the surface of the solid and watery surface of the earth is differently stated. Darby, in his 'View of the United States,' calculates the water-surface to be 160,152,000 square miles, and the land only at 38,840,000 square miles: if this be correct, the land does not amount to one-fourth of the entire superficies of the earth. Some German geographers however are of opinion that the land-area is fully equal to one-fourth of the whole surface, and perhaps a small fraction more.

Several parts of the ocean are distinguished by peculiar names. The widest expanse of salt-water is that which extends between America on the east, and Asia and Australia on the west, and is called the Pacific Ocean. Its boundary-line is pretty well determined by the adjacent continents, which approach one another towards the north, and at Behring's Strait, which separates them, are only about 36 miles apart. This strait may be considered as closing the Pacific on the north. Towards the south both continents are widely separated from one another, and both terminate at considerable distances from the Antarctic Pole: America, in 56° S. lat.; and Tasmania, or Van Diemen's Island, which is an appendage of Australia, between 43° and 44° S. lat. The boundary-line of the Pacific must here be marked by lines drawn from Cape Horn, the most southern point of America, and from South-West Cape, the most southern extremity of Tasmania, to the Antarctic Pole. The expanse of water contained within these boundary-lines is estimated at 100,000,000 of square miles, or nearly half the superficies of the earth.

The ocean which extends between Europe and Africa on the east, and America on the west, and is called the Atlantic, may also be considered as being closed on the north by a strait, but it is one of considerable width. This strait is formed by the northern coast of Norway and the eastern coast of Greenland, which two countries are nearly 900 miles apart, between 68° and 71° N. lat. Towards the south the Atlantic extends to the Antarctic Pole, where it is divided from the Pacific by a line drawn from Cape Horn to the Pole. As Africa projects much farther to the south than the countries to the east of it, that portion of the sea which is east of Africa is not included in the Atlantic; and the eastern boundary-line of this ocean is here considered as formed by an imaginary line drawn from Cape L'Agulhas, the most southern extremity of Africa, to the Antarctic Pole. Within these boundaries the Atlantic, including its numerous seas, as the Mediterranean, the Black Sea, the Baltic, Hudson's Bay, and the Columbian Sea, is estimated to cover an area of nearly 30,000,000 of square miles.

That portion of the ocean which is separated on the east from the Pacific by a line drawn from South-West Cape, and on the west from the Atlantic by a line drawn from Cape L'Agulhas, is called the Indian Ocean. Its surface, including the Red Sea, Persian Gulf, Bay of Bengal, &c., is supposed to occupy more than 25,000,000 of square miles.

The northern coasts of Europe, Asia, and America do not extend to the Arctic Pole, but terminate between 70° and 80° N. lat. Between these coasts is a sea, which may be about 2000 miles across from one continent to the other. This sea is called the Arctic Ocean, or Icy Sea. The latter term has been applied to it from the circumstance of its being encumbered with heavy masses of ice all the year round. This sea is connected with the Pacific by Behring's Strait, and with the Atlantic by the wide strait between Greenland and Norway. Its area is estimated at about 4,000,000 of square miles.

OCEA'NIA. [PULMOGRADA.]

OCE'ANUS, De Montfort's name for the umbilicated form of Nautilus. [NAUTILUS, p. 113.]

OCELLA'RIA. [POLYPIARIA MEMBRANACEA.]

OCELLUS LUCA'NUS, Ὄκελλος ὁ Λευκανός, a Pythagorean philosopher, was a native of Lucania in Italy, and is supposed to have been a disciple of Pythagoras; but the time in which he lived is uncertain. He wrote many works on philosophical subjects, the titles of which are given in a letter written by Archytas to Plato, which has been preserved by Diogenes Laertius (viii. 80); but the only work of his which has come down to us is 'On the Nature of the Universe,' Περὶ τῆς τοῦ παντὸς φύσεως. This work, as we learn from the extracts in Stobæus, was originally written in Doric Greek, and appears to have been transferred in later times into the common Greek dialect. Its chief philosophical topic is to maintain the eternity of the universe (τὸ Πᾶν); Ocellus also attempts to prove the eternity of the human race (c. 3, s. 3).

The best editions of Ocellus are by Batteux, Par., 1768, 3 vols. 12mo., and by Rudolphi, Leip., 1801, which is accompanied with a valuable commentary. The work has been translated into French by the Marquis D'Argens, Berlin, 1762, and by the abbé Batteux, Paris, 1768; and into German by Bardili, and by J. G. Schulthess, Zürich, 1781, 8vo.

OCELOT. [TIGERS.]

OCHILL HILLS, are a system of hills, or rather mountains, in Scotland, the principal ridges of which are situated between 56° 10′ and 56° 20′ N. lat. and between 3° 30′ and 3° 50′ W. long., but the lower ridges extend eastward through the peninsula of Fife between the Frith of Forth and that of the Tay, and terminate a few miles from the North Sea.

The Ochill Hills begin on the west about three miles north-east of the town of Stirling, and on the north side of the road which leads from that place to Alva. Their western edge has the form of a segment of a circle, with its convexity turned to the north-west, and lying nearly parallel to the course of the river Allan, which flows about four miles from the base of the hills. Where this river descends from the hills, the outer edge of the mountain-mass begins to lie nearly due west and east, and continues in this direction until it passes 3° 30′ W. long., whence it continues in an east-north-east direction to the shores of the Frith of Tay and along this frith to the vicinity of Port-on-Craig Ferry. In all this line, which is nearly 40 miles, the Ochills form a continuous mass, and rise from a comparatively low and flat country, which along their western base is called Strathallan, and along the northern, Strathearn. At the foot of the mountains there are elevated moors. The declivity is steep, especially where the mass extends east and west, and in some parts near the base of the mass the sun is not seen for three months in the year. The elevation west of 3° 30′ probably exceeds, on an average, 1000 feet above the sea-level, but the mountains do not rise into peaks or elevated summits. East of 3° 30′ they sink lower, but maintain in general a height of 500 to 1000 feet. The summit of Norman's Law, south of Flisk, on the Frith of Tay, is supposed to be 1500 feet above the sea.

The width of this mountain-mass varies greatly. From its western extremity to near 3° 30′, a space of about 12 miles in length, it is on an average six miles wide. This area is occupied by one mass of rocks, with the exception of a deep narrow valley which traverses the mass in its whole length, and in which the river Devon runs from west to east. The valley, as far down as the church of Muckhart, is hardly more than two furlongs wide in any part, though it widens to half a mile below that place. The mountain-masses to the south of the valley are much higher than those which are north of it, and the highest portion of the Ochill Hills, Ben Cleoch, attains the elevation of 2359 feet above the sea, and several other summits rise to more than 1500 feet. Both mountain-masses are furrowed by narrow ravines, through which the waters descend to the Devon. The southern mountains terminate in the great bend of the Devon, called the Crook of Devon. The width of the ridge which is north of the upper course of the Devon is much less, and probably in no part exceeds two miles, and it grows still narrower as it approaches the Frith of Tay. Its prolongation along the southern shore of that bay is probably only half a mile wide. Another ridge which runs south of this must be considered a lateral ridge of this prolongation. It branches off near 3° 17′ W. long., south of Newburgh, encloses the small lake called Loch Lindores, and extends in a general east-north-east by east direction through the peninsula of Fife, terminating east of Logie, about five miles from the North Sea in the Inchlaw hill, which is about 600 feet high. The highest summits of this ridge probably do not exceed 700 feet, and in many places the range hardly attains 500.

feet. The western part of the valley, between this ridge and that along the Frith of Tay is narrow, but towards the east it widens; between Creig and Kilmany it is four miles wide.

The mountains just described constitute what are generally called the Ochill Hills. But to the south of them several groups and ridges traverse the counties of Fife, Kinross, and Clackmanan, which may be considered as dependencies of the Ochills, though they are separated from them by depressions of considerable width. Such a depression occurs to the north of Loch Leven, between the Ochill and Lomond Hills. The high grounds called the Braes of Orwell, which connect both ridges across this depression, gradually rise from Milnathort to about 450 feet above the sea, and 120 feet above Loch Leven, and descend northward into Strathmiglo. This depression is about 4 or 5 miles wide. On the eastern side of it, West Lomond Hill, or Bishop's Hill, rises precipitously to an elevation of 1721 feet above the sea. A ridge not exceeding 1000 feet in height unites it with East Lomond Hill, which attains the elevation of 1466 feet. Both Lomonds are about 5 miles apart. High grounds extend southwards from the southern declivity of West Lomond Hill to the very banks of the river Leven near its efflux from Loch Leven. A high tract runs eastward from the eastern base of East Lomond Hill, and in some places rises into hills, the most elevated of which are Down Hill, Clatto Hill, and Largo Law; the last is 952 feet above the Frith of Forth, from which it is only two miles distant. From Largo Law a ridge of high ground runs north, terminating east of Kembach, about one mile from the banks of the Eden, and two miles from the shores of the sea, and another east by north, terminating north of Dunino, about 2 miles from the sea. The general elevation of these ridges may be about 300 feet, and some hills are higher. The country enclosed by these ranges may be from 20 to 80 feet above the sea, a height which it maintains to the shores, except on some bays, which are enclosed by sandy and level plains.

South of Loch Leven, and only half a mile from its shores, is the Benarthy Hill, which rises very gradually from the east and terminates abruptly on the west. Its elevation probably exceeds 1000 feet above the sea. Its eastern declivities, which are gentle, approach the river Leven near its efflux from the lake, and two moderately elevated ridges of high ground run eastward between the Leven and Orr rivers, and enclose the valley of the Lochty, terminating near its confluence with the Orr. No elevated hills occur on these ridges. From the western extremity of the Benarthy Hill an elevated tract stretches southward to the eastern extremity of the Cleish Hills, but probably is not much more than 500 feet above the sea. The Cleish Hills, which extend nearly 6 miles east and west, form the boundary-line between Kinross and Fife. They rise to a considerable elevation; the highest summit, Mount Dumglow, is 1215 feet above the sea-level, and three others, called the Ingans, rise respectively to 1030, 1060, and 1048 feet.

The Saline Hills are west of the Cleish Hills, and separated from them by a narrow but rather deep depression. They cover a large surface, being 4 miles long from north to south, and more than two from east to west. They also rise to a considerable elevation, but we are not aware that their height has ever been determined. They may be considered as the nucleus from which the high grounds branch off that traverse Fife, south of the Orr river, and Clackmanan, south of the Devon. The elevated ground between the Orr river and the Frith of Forth extends nearly parallel to the course of the river, east and east-north-east, and terminates between Dysart and Wemys, about a mile from the sea. Except a few hills near Beath, called Beath Hills, it rises only to a moderate elevation, but a high tract of considerable width extends from Beath Hills southward, and terminates, between Aberdour and Kinghorn, in several hills of considerable elevation, as Dunearn Hill (695 feet), Orrock Hill, and the Bin (628 feet); the last-mentioned elevation stands north of Burntisland, half a mile from the sea. The western ridge of high land, which extends through Clackmanan, is rather elevated near the Saline Hills, but gradually decreases as it advances farther west. It terminates in the vicinity of Tillibody, where the Devon river turns to the south, and it contains no high summits.

The Ochill Hills consist chiefly of porphyry and amygdaloid, but the hills which enclose them on the south belong to the coal formation, and are principally composed of limestone, sandstone, ironstone, clay, slate, bituminous shale, greenstone, basalt, and trap-tufa. This district contains one of the most extensive coal-beds in Scotland. It begins on the east in the parish of Dunino, about 6 miles west of Fifeness, and extends to the mouth of the river Devon. The richest part of this coal-field is stated to be between Dysart and Alloa. It is worked at several places. Iron-ore abounds likewise in this tract, and is also worked. As to the other useful minerals, see FIFESHIRE. The lower hills and declivities are cultivated, and the higher hills make excellent pasture-grounds. The whole of this hilly region is destitute of trees, except where they have been planted: the plantations consist of oak, ash, larch, elm, beech, spruce, silver and Scotch fir. (Sinclair's *Statistical Account of Scotland; New Statistical Account of Scotland.*)

OCHNA'CEÆ form a very small natural order of plants nearly allied to Rutaceæ, and remarkable for their fleshy carpels being elevated upon an enlarged succulent receptacle. They are shrubs, inhabiting the tropics of either hemisphere, with shining evergreen leaves, showy yellow flowers, with five or ten stamens, whose anthers open by pores at the point. They appear to be possessed of tonic and astringent qualities. (Lindley's *Natural System of Botany*, ed. 2, p. 129.)

OCHRA, or OKRO, a plant of which the fruit is used as a vegetable in the West Indies, the United States, and in South America, and which is remarkable for the similarity of its name to the vegetable called *Ochra* by the Greeks, but which has not been ascertained by botanists. The names by which the produce of the New World is distinguished in the works of Maregrave and Piso are *Quingombo* and *Quigombo*, and in later works by that of *Gombo*, and *Gombaut*, or *Gombeau*. It is possible therefore that a classical name, which was not otherwise engaged, may have been applied to a new vegetable, and, as has been the case in other instances, without any attempt being made to identify the plant named with that which had been described by classical authors.

The okro has been already alluded to under *Hibiscus*, to which genus it belongs, and is the *H. esculentus* of botanists, which is very closely allied to *H. Abelmoschus*, now *Abelmoschus moschatus*, so long noted for its musk-scented seeds, and which by Browne, in his 'Nat. Hist. of Jamaica,' is called *Musk-okro*. The former is characterised by having a thick unarmed herbaceous stem, leaves cordate at the base and palmate, or divided into five rather obtuse lobes, dentate at the margin, involucels ten-leaved, deciduous petioles longer than the flowers, with the calyx bursting longitudinally. The fruit is from 2 to 4 inches in length, pyramidal in form, furrowed, and filled when in a green state with a large proportion of mucilage, on which account it is esteemed both when cooked as a vegetable, and as an addition to make soup viscid, in the country where it is indigenous, as well as in the South of France and the Levant. A similar but distinct species is employed in the East Indies for the same purpose, whence it has probably been introduced into Africa, as a similar plant is described as being cultivated there, and the fruit employed for the same purpose. The seeds may be added like barley to soups, and have been recommended to be roasted as a substitute for coffee.

OCHRE, hydrated sesquioxide of iron. [IRON.]

OCHROITE. [CERIUM, ORES OF.]

OCHSENHAUSEN is a principality in the circle of the Danube, in the kingdom of Würtemberg, about 56 square miles in extent, with a population of 6000 inhabitants. It formerly belonged to a Benedictine abbey: the abbot was raised by the emperor Francis I., in 1740, to the rank of a prince of the Empire. In the year 1803, the greater part of it was assigned as an indemnity to Prince Wenzel Lothar von Metternich (the Austrian high-chancellor), but of the revenue, amounting to 70,000 florins, he is bound to pay over 20,000 florins for certain purposes.

The town of Ochsenhausen, situated on the river Rottum, in 48° 4′ N. lat. and 10° E. long., has 1400 inhabitants. The fine buildings of the antient Benedictine abbey, and the church, which is distinguished for its size and beauty, are looked upon as the chief ornaments of that part of the country. These buildings are now, under the name of Winneburg, the residence of the prince.

OCKLEY, SIMON, was born at Exeter in 1678, entered Queen's College, Cambridge, in 1693, was presented to the vicarage of Swavesey in 1705, was chosen professor of Arabic in the university of Cambridge in 1711, and died at Swavesey, August 9, 1720.

Ockley had paid great attention to the study of the Oriental languages, and was well acquainted with the Arabic. His principal work, 'The History of the Saracens,' which was originally published in two volumes 8vo., the first in 1708, and the second in 1718, was compiled from Arabic manuscripts in the Bodleian library at Oxford. This work, which commences at the death of Mohammed, and terminates in the year 705, contains much valuable information respecting the early conquests of the Arabs, and may still be consulted with advantage by those who are unacquainted with the Oriental languages. Gibbon made considerable use of it in his 'Decline and Fall,' and speaks of the author in his autobiography as 'an original in every sense, who had opened his eyes.' This work however does not appear to have brought Ockley much profit; for he complains, in his inaugural oration, in 1711, of his straitened circumstances, and dates the second volume of his history from Cambridge Castle, where he was imprisoned for debt.

Ockley wrote several other works, of which the principal are:—'Introductio ad Linguas Orientales, in qua iis discendis via munitur, et earum Usus ostenditur,' 1706; 'The History of the present Jews throughout the World,' 1707, translated from the Italian of Leo of Modena, a Venetian Rabbi; 'The Improvement of Human Reason exhibited in the Life of Hai Ebn Yokdhan,' 1708, translated from the Arabic; 'An Account of South-west Barbary,' 1713; a new translation of the second 'Apocryphal Book of Esdras,' from the Arabic version of it, 1716.

OCOOCH HILLS. [MISSISSIPPI River.]

O'CREA (a boot) is a term used in descriptive botany to express those kinds of stipulæ which grow together by their back and front edges in such a way as to form a tube, through which the stem passes. The genera Polygonum, Rheum, and Rumex offer a common illustration of this structure.

OCTAGON. [POLYGONS, REGULAR.]

OCTAHEDRON. [SOLIDS, REGULAR.]

OCTANS (the instrument commonly called a quadrant, which, when on Hadley's construction, is of the form of an *octant*, or eighth part of a circle), a constellation of Lacaille, situated at the south pole, which it includes. The principal stars are as follows:—

Character.	No. in Catalogue of Lacaille.	No. in Catalogue of Astron. Society.	Magnitude.
δ	1190	1609	5
α	1686	2472	5
β	1811	2700	6
γ^1	1917	2849	5
γ^2	1921	2861	6
γ^3	1940	10	5

OCTANTS. [SYZYGIES, &c.]

OCTAVE (*Octavus*, Lat.), in Music, the eighth note of the scale, the most perfect of concords, whose ratio is 2 : 1, therefore the simplest of all the sounds, except the unison. The harmonics of the octave and unison agree invariably, a coincidence which occurs in no other interval, and these sounds have so close a resemblance, that in combination they are hardly distinguishable, the one from the other. The following are the properties, says Rousseau, which so singularly distinguish the octave from all other intervals:—The Octave embraces all the primitive sounds, that is to say, all the original tones and semitones. Hence, after having established a system or series of notes within the limits of an octave, if it be wished to extend this series it will be absolutely necessary to follow the same order in a second octave, in a third, or a fourth, &c., and no sound will be found in any of these but what is, as it were, a recurrence of some one in the first series. It is in virtue of this property in the Octave that the term *Diapason* was applied to it by the Greeks. [DIAPASON.]

The Octave has also another remarkable property, the same writer observes, namely, that it may be doubled, tripled, and multiplied at pleasure, without changing its nature. This multiplication, however, is limited as relates to its effect on the ear, and an interval of eight octaves, for instance, would be scarcely, if at all, appreciable as such by the auditory organ. A double Octave is less agreeable than a single one; a triple Octave loses still more of its pleasing quality; till, by increasing the distance, the relationship of the sounds becomes nearly undistinguishable.

OCTAVE, THE RULE OF, or what the French call *La Règle de l'Octave*. [ACCOMPANIMENT *of the Scale*.]

OCTA'VIA. [ANTONIUS, M.]

OCTHO'SIA. [CIRRIPEDA, vol. vii., p. 209.]

OCTOBER, in the year of Romulus, was strictly what its name implies, the eighth month. With us it is the tenth. Suetonius tells us that Domitian, who was born in this month, gave it his own name (Sueton., *Domit.*, c. 13); but it lasted during his life only (Plutarch, *Num.*, p. 72; Macrobii *Saturnal.*, i. 12). Antoninus Pius, in honour of his wife Faustina, called it 'Faustinus' (Julius Capitolinus, c. 10); and the flatterers of Commodus assigned to it one of their patron's epithets, 'Invictus.' (Ælius Lamprid., ed. Lugd. Bat., 1671, p. 507.) Our Anglo-Saxon ancestors called it *se teotha monath*, the tenth month; they also gave it the name of *Winter-fyllith*, winter-beginning. (Bosworth, *Sax. Dict.*, v. 'Monath.')

OCTO'CERA, M. de Blainville's name for the first family of his order *Cryptodibranchiata*, containing the genus *Octopus*.

OCTOLASMIS, Mr. Gray's name for a genus of Cirripeds (*Heptalasmis*, Leach).

OCTO'MERIS. [CIRRIPEDA, vol. vii., p. 210.]

O'CTOPUS. [CEPHALOPODA; SEPIADÆ.]

OCULI'NA. [MADREPHYLLICEA.]

O'CYMUM, a genus of labiate plants, remarkable for the fragrance of their leaves, which are used as an ingredient in savoury dishes, on which account some of the species have from time immemorial been objects of very general cultivation. In English gardens they are called Basils, a corruption of Basilisca, the name given to common basil by the monkish writers upon plants, in allusion to its regal qualities.

Of common basil (*Ocymum Basilicum*, Linn.) there are many varieties, differing in their size, in the form and colour of their leaves, and in minor particulars: in their qualities they are nearly alike. This species is found wild in the hotter parts of the East Indies, where it is a perennial, with a woody root; but in our gardens it is treated as a tender annual, being raised in the spring in a hot-bed, and turned into a warm border when the summer is so far advanced that there is no longer any danger from frost, which is instantly fatal to such plants. Besides this Mr. Bentham enumerates forty-three other species (*Labiatarum Genera and Species*, p. 18), one of which, the *O. viride*, is used as a febrifuge in Sierra Leone. The genus is readily known by its calyx being bent downwards when the fruit is ripe, and then appearing covered as it were by a very large ovate dorsal lobe, and by the stamens being declinate.

OCYPO'DIANS, a tribe of *Brachyurous Crustaceans*, placed by M. Milne Edwards between the *Pinnotherians* and the *Gonoplacians*.

Character of the Tribe.—*Carapace* rhomboidal or trapezoidal, very much elevated anteriorly and depressed posteriorly; the frontal border occupying the whole width, and the *front*, which is lamellar and bent down to the *epistome*, extremely narrow; its width does not equal a third of the length of the eyes, nor the half of the width of the buccal frame, which itself is very narrow. The *eyes* are very long and the *cornea*, in general, is very large. The basilary joint of the *internal antennæ* is oval, rather large, and placed vertically in the anterior angle of the orbit; the moveable stem of these appendages is extremely small and hidden under the front; the two terminating filaments are very short, large, and hardly annulated, a disposition which is not observed in any of the crustaceans previously treated of in the system of M. Milne Edwards, except in the *Dotos*. The *external antennæ* are rudimentary, and situated, as they ordinarily are, in an opening of the internal angle of the orbit; their first joint is less than the second, and the third only reaches to the edge of the anterior border of the basilary joint of the internal antenna. The *epistome* is continuous with the lower border of the orbit, and the buccal frame is remarkably more narrow anteriorly than it is posteriorly. The *external jaw-feet* close the mouth completely; the interior border of their lamellar portion is straight; their third joint is very much elongated, and their fourth inserted at the external angle of the preceding. The *sternal plastron* has a trapezoidal form, the

base of which is directed backwards; it is strongly curved in its longitudinal direction, and gives passage to the male organs at a considerable distance from its external border. The anterior feet are, generally, compressed and of very unequal size; the rest are very long and exhibit no great difference between themselves; the terminating joint is often depressed, but has never the form of a natatory oar. The *abdomen*, composed ordinarily of seven distinct segments in both sexes, is very narrow. In general it does not cover more than a third of the posterior portion of the sternal plastron of the male, and even in the female leaves that part of the plastron which approaches the base of the feet exposed. In the greater part of the cases, if not always, there are only seven *branchiæ* on each side of the thorax, five of which only are couched under the vault of the sides, and two reduced to the state of vestiges only, and fixed to the jaw-feet. (M. Edwards.)

Locality and Habits of the Tribe.—The Ocypodians, as their name implies, are very swift runners, living nearly always on the strand, where they dig holes for themselves.

M. Milne Edwards, who remarks that this small and very natural group is closely allied to the genera *Doto* and *Mycteris* among the Pinnotherians, thus divides the tribe:—

Tribe of Ocypodians.	Cornea transparent, very large, oval, occupying at least the half of the length of the ocular peduncles, and commencing very near the base of those stems	Ocypoda.
	Cornea transparent, very small, rounded, not occupying the fourth part of the length of the ocular peduncle, and only commencing close to its extremity.	Gelasimus.

Ocypoda. (Fabricius.)

Generic Character.—*Carapace* rhomboidal or even nearly square, and nearly as large behind as before; its upper surface, which is nearly transversely horizontal, but a little curved in a longitudinal direction, is strongly inclined downwards and backwards; its anterior and lateral surfaces are very much elevated and nearly vertical, and those last are divided into two portions by an elevated vertical line which terminates between the base of the third and fourth pair of feet. The *front* is much longer than it is wide; it does not cover the articulation of the ocular peduncles, and only equals in width the half of the epistome, to the anterior border of which it unites itself. The orbits are very large, not deep, and divided into two distinct portions, one internal or foraminal, which gives insertion to the ocular peduncle, and which in the *Cyclometopes* and *Oxyrhynchi* is always hidden under the front; the external portion serves for the lodgment of the major part of the eye and its peduncle. The upper border of these cavities, which is much less advanced than the lower, presents a disposition which accords with this division, for it describes two curved lines which unite in forming an angle, the summit of which is directed forwards. The form of the *eyes* is also very remarkable; the cornea is oval, very large, and extends below within a very small distance of the base of the peduncle; but in general this last is prolonged beyond its extremity, so that the eyes terminate with a kind of horn, the length of which seems to increase with age. The *internal antennæ* are disposed as stated in the character of the group; the *external antennæ* are rudimentary; their third joint is not half so long as the second, and their terminal stemlet is scarcely longer than their peduncle. The *epistome* is very small and presents at its median part a small quadrilateral prolongation which is soldered to the front. The third joint of the *external jaw-feet* is quadrilateral and much smaller than the preceding; it never hides the sort of appendage formed by the three succeeding joints, and the palp which occupies the external border of these members is styliform and deprived of a multi-articulate terminal filament. The *anterior feet* are, in general, shorter than the rest, and the hand which terminates them is much compressed and very large in comparison with the arm: the difference between the hands of each side is often very great, especially in the male. The succeeding feet are also much compressed, and increase in length up to the fourth pair inclusively; these last are about thrice the length of the post-frontal portion of the *carapace* and the posterior feet are much shorter; the tarsi are always compressed and nearly of the form of a small spatula, and at the basilary joint of the third and fourth pair there is a sort of articular surface surrounded with hairs, which seems destined to diminish the friction of these two members against each other. The *abdomen* is much narrower at its base than the posterior part of the thorax, and, in both sexes, leaves a considerable portion of the last segments of this part of the body exposed; in the male, it has a triangular, elongated form, and advances to the anterior extremity of the plastron; in the female its last segment is not a fourth as large as the preceding, and is ordinarily received in a notch of its anterior border. The first pair of abdominal appendages, in the male, are very much developed, cylindrical and slightly hooked towards the end; the second pair are, in general, rudimentary.

The branchia which ordinarily exists on the antepenultimate joint of the sides is wanting in the *Ocypodæ*; the others are directed very obliquely backwards, and the branchial cavity is elevated so as to leave above a great void space which is lined by a membrane more or less spongy. (M. Edwards.)

Habits of the Genus.—So rapid are the *Ocypodæ* in their motions, that those who have observed these animals in their native haunts declare that they run so fast that a man can hardly overtake them. They hollow out holes for themselves in the sand of the sea-bank, and remain shut up in their burrows throughout the winter.

Geographical Distribution.—The warm climates of both hemispheres.

M. Milne Edwards records seven recent species, which he separates into two divisions, observing, at the same time, that the species are difficult to distinguish on account of the changes which age produces on the form of these crustaceans.

A.

Species whose transparent cornea occupies the extremity of the ocular peduncle, and is not overpassed by a styliform prolongation or a terminal tubercle.

Example, *Ocypoda arenaria*, *The Sand-Crab* of Catesby.



Ocypoda Arenaria. *a*, under side of the head. (M. Edwards.)

Length about two inches; colour yellowish.

Locality.—The coasts of North America and the Antilles.

Habits.—This species lives in holes three or four feet deep, which it hollows out in the sand immediately above the level of the wash of the sea. Its general time of quitting the burrow to seek its food is the night, and when pursued it runs with great swiftness, elevating at the same time its claws in a menacing manner. This is their summer life; but towards the end of October they retire inland to hybernate in the earth. When they have found a place proper for their purpose, they dig a hole like that which they had occupied on the edge of the sea; and, after entering therein, stop up the entrance so cleverly that no trace of its existence is left. Then they retire to the bottom, and there remain till the warm weather brings them forth, when they again repair to their marine residences.

B.

Species whose eyes carry at their extremity an appendage, in the form of a tubercle, cylinder, or stylet, which overpasses the transparent cornea.

Example, *Ocypoda hippea.* Terminal appendage of the eyes large, short, conical, and furnished at its extremity with a pencil of long hairs. Length, two inches, French.

Locality.—Syria, Egypt, Cape de Verd, &c.

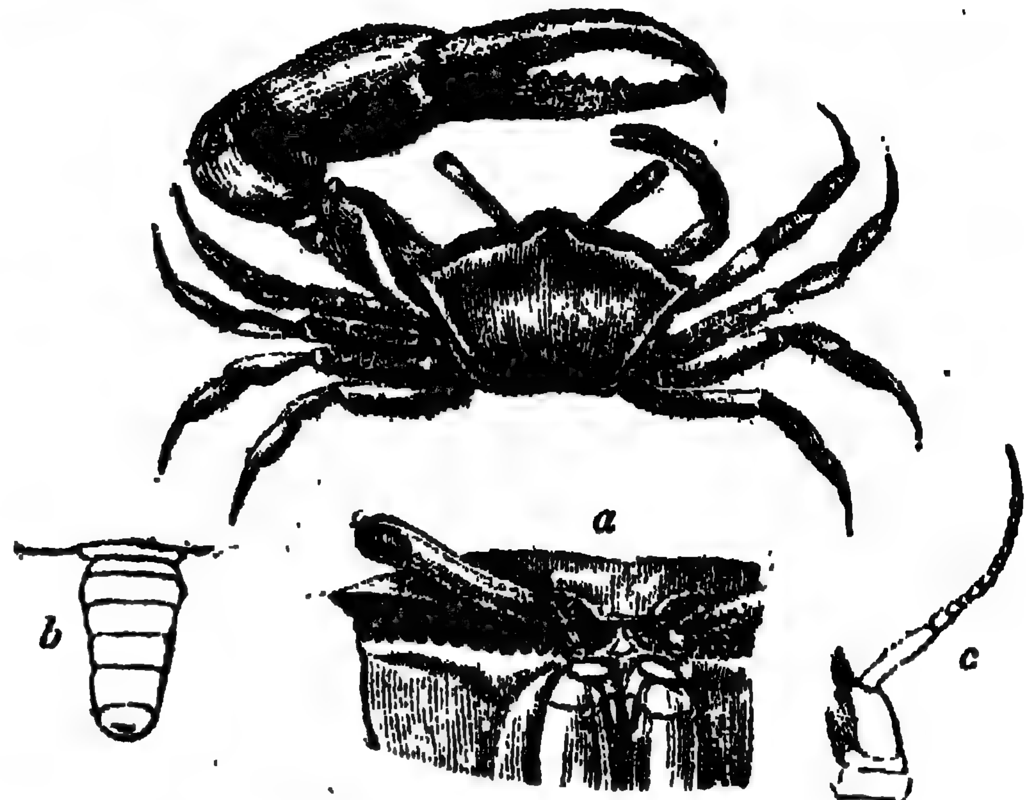


Ocypoda hippea.
a, pincers; *b*, under side of male, in detail. (M. Edwards.)

Gelasimus.

Generic Character.—*Carapace* much wider than that of *Ocypoda*, more convex, and much narrower backwards. Stomachal region very small, and genital region generally very large. Disposition of the *front* and of the *internal antennæ* nearly the same as in the preceding genus; *ocular peduncles*, on the contrary, very narrow, and the cornea which terminates them not occupying more than its fifth part; upper border of the orbits much less projecting than the lower; not divided into two portions as in the *Ocypodæ*, and convex nearly throughout its length; external extremity of those cavities largely open, and communicating with a furrow which is obliquely directed behind and downwards. *External Antennæ* much more developed than in the preceding genus. The *external jaw-feet* have the same form as the *Ocypodæ.* The *anterior feet*, in general, very small in the female; but, in the male, one of them acquires enormous dimensions. Sometimes it is the right, sometimes the left claw which grows to this great size, being, in certain instances, twice as large as the body. The claws of the smaller anterior foot are enlarged and lamellar towards the end and a little contorted; those of the great anterior foot are arched, elevated, and slightly dentated on the edges. The rest of the feet are moderate, and present nothing remarkable. The same remark applies to the abdomen.

M. Milne Edwards, who gives the above character, states that Mr. Thomas Bell had informed him that some *Gelasimi* have at a certain age, if not always, a stylet at the extremity of the ocular peduncle, on the side of the great claw, whilst the eye of the opposite side always retains the ordinary form.



Gelasimus annulipes. (Indian Seas.)
a, under side of head; *b*, abdomen; *c*, antenna. (M. Edwards.)

Geographical Distribution of the Genus.—The warm countries in both hemispheres.

Habits of the Genus.—The *Gelasimi* live in holes near the edge of the sea, in pairs, and the great claw of the male is used to stop the entrance of the hole.

The species are numerous; but they, as well as the *Ocypodæ*, are difficult to be distinguished, because the parts which differ the most, namely the front and the great claw, change their form with the progressive age of the animal.

Example, *Gelasimus Marionis.* Length about 8 lines; width about an inch, French.

Locality.—Manilla.



Gelasimus Marionis.

FOSSIL OCYPODIANS.

Gelasimus.

The fossil species which most resembles *Gelasimus Maracoani* seems to be *Gelasimus nitidus*, figured by M. Desmarest in his *Histoire Naturelle des Crustacés fossiles*, but the lateral edges of the carapace in the fossil are quite smooth, and the front is terminated by a very short sharp point. Neither the geological nor geographical locality appears to be known. The specimen is in the Paris museum.

OCY'PTERUS. [SHRIKES.]

OCY'RÖE. [CILIOGRADA, vol. vii., p. 165.]

OCY'THÖE. [CEPHALOPODA; PAPER NAUTILUS.]

OCZAKOW, a Russian town in the government of

Kherson, is situated in 46° 37′ N. lat. and 31° 30′ E. long., on a small brook near the mouth of the river Dnieper, which is here about four miles and a half wide between Oczakow and Kinbourn. Oczakow, though never a large place, was formerly one of the most important fortresses in this part of the country, and had a citadel, the walls of which were twenty-five feet high. The population was at that time 5000. It is chiefly remarkable for the importance that was attached to it in the wars between the Turks and the Russians in the last century. In 1737 it was taken by storm by the Russians under Count Munich, but with the loss of 18,000 men. In the same year a Turkish army of 70,000 men attempted to recover it, but was repulsed with the loss of 20,000 men. The Russians, having razed the fortifications, abandoned the place in 1738. The Turks re-occupied it in 1743, and held it till 1788, when, after a six months' siege by the Russians under Suwarroff, it was taken by storm. The English government interfered in 1790, to oblige Russia to restore it to Turkey; but the Porte ceded the place, which was quite devastated, at the peace of 1791. Oczakow has never recovered, and has not at present above 1000 inhabitants, consisting of Greeks, Armenians, Turks, Russians, and Moldavians. This however may be ascribed in a great measure to the rise of Odessa, which attracted both its trade and its population. The town is still of some importance, because the larger merchantmen going to Kherson are obliged by the shallowness of the sea to stop at Oczakow, where the goods are put on board smaller vessels. Not far from Oczakow, at the village of Tarutino, at the mouth of the Bug, are the ruins of the antient Milesian colony of Olbia, where numerous antiquities, particularly antient coins, are frequently found.

ODE is derived from a Greek word, which signifies a song (ᾠδή, ἀοιδή), and appears to have been originally applied to any kind of poetry which was written to be sung or accompanied with music. The ode may be regarded as the foundation of lyric poetry, and differs from epic poetry in delineating the poet's own thoughts and feelings, while the latter species of poetry details external circumstances and events. The most celebrated Greek and Roman odes are those of Pindar, Horace, and Anacreon. In English the best odes have perhaps been written by Dryden and Gray. For a further account of this species of poetry the reader is referred to LYRIC POETRY.

ODENA'TUS, or ODENATHUS. [ZENOBIA.]

ODENSEE. [FÜNEN.]

ODENWALD. [GERMANY.]

ODER, River. [GERMANY.]

ODERIT is probably black mica; for, like that substance, it may be split into thin leaves. It is opaque, black, and has very little lustre. Its colour is probably owing to some foreign substance, which may cause the difference between its appearance and that of common mica. It occurs in Sweden.

ODESSA, a seaport and important commercial town of Southern Russia, in the government of Kherson, is in 46° 28′ N. lat. and in 30° 42′ E. long., at the north-western extremity of the bay of Adschai. This town, which is now so flourishing, and constantly increasing in extent and importance, was a miserable village called Kodschabeg when the empress Catherine obtained possession of Oczakow and the part of the country as far as the Dnieper, by the treaty of peace of 1791. Ever since the time of Peter I. the Russians had been very desirous of an establishment on the Black Sea, especially after they had got possession of the south-east part of Poland. Catherine chose this spot for the site of the new town and seaport, and several regiments were employed in 1794 in digging the foundation and in the construction of public works. The site is on the whole well chosen. There is no river, but it has a fine bay, with sufficient depth of water, almost to the very shore, for the largest men-of-war. The bottom is fine sand or gravel, and the bay is seldom frozen, and then only for a short time.

The emperor Alexander completed what Catherine had begun. He appointed the Duke of Richelieu, a French emigrant nobleman, who had entered the Russian service, to the post of governor of the new town, under whose judicious administration its prosperity rapidly increased. The first inhabitants of Odessa were some Greek families, but in 1804 the population already amounted to 15,000. The town is regularly built in the form of an oblong parallelogram, on a declivity sloping towards the sea. The surrounding country is an extensive and fertile plain, but the climate is unhealthy at some seasons of the year. The harbour, which is formed by two large moles, and can contain two hundred ships, is defended by strong works. At the eastern extremity is the citadel, and at the other the lazaretto; on a projecting point of land on the south side of the bay there is a lighthouse. The road is very spacious, and the anchorage safe, being protected against all winds except the south-east. The town is well built; the streets are broad and straight, but not paved. The houses are in general two stories high, and built of stone. There are many fine buildings: among them the church of St. Nicholas, which is the Russian cathedral, the Protestant church, the admiralty, the hospital, the custom-house, the exchange, and the theatre, where Russian pieces, Italian operas, and Greek tragedies are performed. There is a fine public garden in the middle of the town. Between the harbour and the town there is a line of barracks, consisting of sixteen detached edifices; there are in the town nearly six hundred corn-magazines, and a bazar, which contains 556 shops.

To the north of the town there are magazines of salt and salt meat, and to the west of them reservoirs of water. The rivers which flow into the sea on both sides being at a considerable distance, Odessa used often to suffer from want of water, but this disadvantage has been remedied by the construction of an aqueduct. The chief establishment for education is the Lyceum, founded by the Duke de Richelieu, on the plan of those in France, and called by his name; two schools for jurisprudence, political economy and commerce, and a school for training schoolmasters, are connected with the Lyceum: the other institutions are a school for young ladies, a school of trade and navigation, a model-school for young Jews, the academy of the Oriental languages, the museum of the antiquities of Southern Russia, and the botanic garden and the Agricultural Society. Three public baths have been established of late years, chiefly for the Poles, many of whom come to Odessa for the benefit of sea-bathing. The total population of Odessa, with its suburbs of Perisip and Moldawanka, was 63,000 at the end of 1837, among whom there are many Jews, Poles, Greeks, Armenians, and German mechanics. The labouring class consists chiefly of Little Russians, who speak a Russian dialect, and are for the most part runaway serfs. The adjacent country is inhabited by settlers from different parts of Germany, by Bulgarians, gypsies, Polish and Russian peasants. Of the Russian inhabitants of the adjacent country, the men are a robust well-built race; the women, on the contrary, are very ugly, dirty, and lazy. The Jews are in general very dirty in their dress; the costume of the Jewesses, many of whom are very handsome, is more ornamental, and often rich. The Greeks appear in a motley mixture of Turkish or Slavonian costumes. The Greek women are very handsome, and their dress pleasing and tasteful.

In the year 1817 Odessa was declared a free port for thirty years, into which all foreign goods are admitted free of duty. The space allotted to the free port is enclosed with a circular wall to prevent smuggling into the interior. The most important article of exportation is corn from the Ukraine. Wheat is exported to Turkey, Italy, France, Spain, and England. The principal towns with which Odessa is directly connected are Trieste, Leghorn, Marseille, Barcelona, and London. Other articles brought from the Ukraine for exportation are flax, timber, tallow, and hides. The imports are colonial produce, and manufactures of all kinds. The richest merchants are English, French, and Italians; many Jews and Armenians are also engaged in trade.

Odessa has considerable breweries and distilleries, and manufactories of woollens and silks, tobacco, soap, and candles. There is a great want of mechanics in the town, and of agricultural labourers in the country. The Russian government has granted great advantages to settlers of both kinds. Within these few years many gardens have been formed in the environs.

The commerce of Odessa in 1838 was remarkably prosperous: the value of the exports exceeded 38 millions of rubles, and that of the imports was nearly 22 millions of rubles. Above 800 foreign ships (of which 160 were English) entered the port, and nearly 800 sailed laden with the productions of Southern Russia, amongst which was above a million chetwerts* of wheat. Of vessels employed in the

* A chetwert is 289 lbs. English.

coasting-trade, 659 arrived and 702 sailed. The customs' duties were, 1, for the Richelieu Lyceum, 3,274,686 rubles (there is a small duty on every chetwert of corn); 2, for the town of Odessa, 1,630,612; 3, for the lighthouses, 19,975: in all, 4,925,273 rubles. The year 1839 will probably show a further increase in the trade of Odessa; for the value of the exports in the first six months of the year was 23,109,990 rubles, whereas it was only 13,855,324 in the first six months of 1838. Up to August the imports were 12,662,162 rubles; 492 ships had arrived, and 473 sailed.*

(Hassel; Stein; Cannabich; and the *Russian Official Journal of the Chamber of Merchants.*)

ODIN, or OTHIN, was the principal deity of the antient Scandinavians and Northern Germans. 'Wodan,' or 'Gwodan,' was another form of the name of Odin. Odin is represented by some as the god of war, the Mars of Scandinavian mythology. (Paulus Diaconus; Adamus Bremensis; Braun, *Religion der alten Teutschen.*) Among the Anglo-Saxons, Wodan was the god of merchants, corresponding to the Hermes of the Greeks. The fourth day of the week, Wednesday, derived its name from this deity. In the account of the origin of the world, as given in the older Edda, Odin, the eldest son of Bör, the second man, is represented as having, with his two brothers Vilé and Vé, defeated and slain the frost giant Ymer, out of whose body they formed the habitable world. According to this fable, Odin and his brethren and antagonists are personifications of the elements of the world. [MYTHOLOGY, *Physical Theory.*] But there is another and a younger Odin, who is partly a mythological and partly an historical personage.

In all the Scandinavian traditions preserved by the chroniclers, mention is made of a chief, called Odin, who came from Asia with a large host of people called Aser, and conquered Scandinavia, where he built a city called Sigtuna, with temples, and established a worship and a hierarchy; he also invented or brought with him the characters of the Runic alphabet; he was in short the legislator and civiliser of the North. He is represented also as a great magician, and was worshipped as a god after his death, when some of the attributes of the older Odin were ascribed to him. (Messenius, *Scandia Illustrata;* Münter, *Ecclesiastical History of Denmark;* Finn Magnusen, *Priscæ veterum Borealium Mythologiæ Lexicon*, Copenhagen, 1828.)

The epoch of this emigration of Odin and his host is a subject of great uncertainty. Some place it in the time of the Scythian expedition of Darius Hystaspis; others (and this has been the most common opinion among Scandinavian archæologists) fix it about the time of the Roman conquests in Pontus, about 60 B.C. Suhm, in his 'Geschichte der Nordischen Fabelzeit,' enumerates four Odins. One was Bör's son; he came from the mouths of the Tanais, and introduced into the North the worship of the sun. A second, the son of Hermodi, came with the Aser from the borders of Europe and Asia at the time of the invasion of Darius Hystaspis, and brought with him the Runic alphabet, built temples, and established the mythology of the Edda: he is called Mid Othin, or Mittel Othin. A third Odin, according to Suhm, was the son of Fridlef; he fled from the borders of the Caucasus at the time of Pompey's conquests, 50 or 60 years B.C., settled at Upsala, and distributed Norway, Denmark, Gothland, and Scania among his several sons. The fourth Odin, called also the Saxon Odin, lived in the third or fourth century of our æra, and is alluded to by Saxo Grammaticus and other chroniclers. All this however is far from being authenticated, though the north-western emigration of Odin from the borders of the Caucasus to Scandinavia has the support of a uniform tradition in its favour. For the antient mythology of Scandinavia see EDDA.

Wodan, or Odin, was worshipped by the Saxons, the Alemanni, the Longobards, and other German nations, until their conversion to Christianity.

ODO, Bishop of Baieux. [BAIEUX TAPESTRY.]

ODO'ACER, a Gothic chief, who, according to some authorities, was of the tribe of the Heruli, originally served as a mercenary in the barbarian auxiliary force which the later emperors of the West had taken into their pay for the defence of Italy. After the two rival emperors Glycerius and Julius Nepos were both driven from the throne, Orestes, a soldier from Pannonia, clothed his own son Romulus, yet a minor, with the imperial purple, but retained all the substantial authority in his own hands. The barbarian troops now asked for one-third of the lands of Italy to be distributed among them as a reward for their services. Orestes having rejected their demand, they chose Odoacer for their leader, who immediately marched against Orestes, who had shut himself up in Pavia. Odoacer took the city by storm, and gave it up to be plundered by his soldiers. Orestes was taken prisoner and led to Placentia, where he was publicly executed, in August, A.D. 476, exactly a twelvemonth after he had driven Nepos out of Italy. [NEPOS.] Romulus, who was called Augustulus by way of derision, was in Ravenna, where he was seized by Odoacer, who stripped him of his imperial ornaments and banished him to a castle of Campania, but allowed him an honourable maintenance. Odoacer now proclaimed himself king of Italy, rejecting the imperial titles of Cæsar and Augustus. For this reason the Western empire is considered as having ended with the deposition of Romulus Augustulus, the son of Orestes. Odoacer's authority did not extend beyond the boundaries of Italy. Little is known of the events of his reign until the invasion of Theodoric, king of the Ostrogoths, who, at the instigation, as some historians assert, of Zeno, emperor of the East, marched from the banks of the Danube to dispossess Odoacer of his kingdom. Theodoric, at the head of a large army, defeated Odoacer near Aquileia, and entered Verona without opposition. Odoacer shut himself up in Ravenna, A.D. 489. The war however lasted several years; Odoacer made a brave resistance, but was compelled by famine to surrender Ravenna (March, 493). Theodoric at first spared his life, but in a short time caused him to be killed, and proclaimed himself king of Italy. (Procopius; Cassiodorus.)

ODONTIS. [MONODONTA.]

ODONTO'PHORUS. [TETRAONIDÆ.]

ODOSTO'MIA, Fleming's name for a genus established from several small species of land shells—*Turbo plicatus, spiralis, unidentatus*, &c. of Montagu. The following is the *Generic Character.*—Shell conical; aperture ovate; peristome incomplete retrally, and furnished with a tooth on the pillar.

ODYSSEY. [HOMER.]

ŒCOLAMPA'DIUS. [ZWINGLI.]

ŒCUMENICAL COUNCILS. During the first and the greater part of the second century after the Christian æra, the Christian communities called churches were independent of each other. In process of time assemblies were held for the purpose of collecting the opinions of the churches on any points of faith or practice respecting which disputes had arisen. These assemblies were at first provincial, and consisted of the bishops only, or of the bishops and some of the inferior clergy, as representatives of the churches. They had their origin among the Greeks, by whom they were named *Synods* (σύνοδοι, that is, *Meetings*), and were adopted by the Latins, who called them *Councils* (Concilia): their decrees were called *Canons* (κανόνες, that is *Rules*). We have no trace of them till towards the end of the second century.

Constantine the Great was the first who attempted to assemble a council consisting of representatives from the whole Christian church. Such councils were called *Œcumenic* or *Œcumenical* (οἰκουμενικοί, that is, *general* or *universal*), from their comprising the whole Roman empire, which, in common language, was considered as equivalent to the habitable world (Œcumene, ἡ γῆ οἰκουμένη). The canons of such councils were considered to be binding on the whole church. The following list contains those which are considered as general councils by the Latin church. There never was an œcumenical council in the strictest sense of the word. Of those in the following list, the first seven alone have any pretensions to the title, as all the others were held after the schism between the Greek and Latin churches: the latter can be accounted œcumenical only by those who consider the church of Rome to contain the whole Catholic church. At the first seven however the number of representatives from the Eastern church was very small.

I. *The First Council of Nice*, convened by Constantine

* The following was received from St. Petersburg on the day when this article was sent to press:—

'*Odessa, December* 12, 1839. This will be a remarkable year in the annals of our commerce, on account of the great number of vessels from foreign countries which have entered the port. Up to this time they amount to 973, and a great many more are expected. The English far exceed in number those of any other nation; they already amount to 306; and out of 160 vessels now at anchor in the port, 60 are English. It is said that 50 more will arrive shortly, most of them being already in the Black Sea. The number of Greek and Neapolitan ships has likewise considerably increased this year.'

to settle the Arian controversy, A.D. 325. [NICE, COUNCIL OF.]

II. *The First Council of Constantinople*, convened by Theodosius the Great, to settle controversies respecting the Trinity. It added to the Nicene creed the words which relate to the divinity of the Holy Ghost, A.D. 381.

III. *Council of Ephesus*. It condemned the Nestorian heresy, A.D. 431. [NESTORIANS.]

IV. *Council of Chalcedon*, against Eutyches, A.D. 451. [CHALCEDON; EUTYCHIANS.]

V. *The Second Council of Constantinople*, convened by Justinian I., on the resurrection of the body and the pre-existence of the soul. It condemned the Origenists and the 'Three Chapters,' A.D. 553.

VI. *The Third Council of Constantinople*, under Constantine Pogonatus. It condemned the Monothelites, A.D. 680. [EUTYCHIANS.]

VII. *The Second Council of Nice*. It approved the worship of images, A.D. 787.

VIII. *The Fourth Council of Constantinople*. It condemned Photius, A.D. 869.

IX. *The First Lateran Council*, convened by Pope Calixtus II. It decided in favour of the church's sole right of investiture to ecclesiastical offices, and decreed the celibacy of the clergy, A.D. 1123.

X. *The Second Lateran Council*, under Pope Innocent II., against the heretics Pierre de Bruis and Arnold of Brescia, and for the reformation of the church, A.D. 1139.

XI. *The Third Lateran Council*, under Pope Alexander III. It condemned the Waldenses and Albigenses, and settled the mode of electing the popes, A.D. 1179.

XII. *The Fourth Lateran Council*, under Pope Innocent III. It condemned the Albigenses, and defined the doctrine of transubstantiation, A.D. 1215.

XIII. *The First Council of Lyon*, under Innocent IV., for promoting the Crusades, restoring ecclesiastical discipline, and dethroning the emperor Frederick II., A.D. 1245.

XIV. *The Second Council of Lyon*, under Gregory X., for the re-union of the Greek and Latin churches, A.D. 1274.

XV. *Council of Vienne*, under Clement V., convened to suppress the Templars, to condemn heretics, and to assist the Christians in Palestine, A.D. 1311.

XVI. *Council of Constance*, convened by the emperor Sigismund, to settle the papal schism. It condemned John Huss and Jerome of Prague to the flames. It sat from 1414 to 1418 A.D. [CONSTANCE, COUNCIL OF.]

XVII. *Council of Basel*. Sat from 1431 till 1448 A.D.

XVIII. *Fifth Lateran Council*; convened by Pope Julius II., to oppose another which had been held the year before at Pisa by nine cardinals, A.D. 1512.

XIX. *The Council of Trent*, convened by Paul III., in order to crush the Reformation. It sat from 1545 to 1563 A.D. [TRENT, COUNCIL OF.]

ŒCUME'NIUS was bishop of Tricca in Thessaly. The time at which he lived is uncertain: but it was after the eighth century and before the tenth. He is generally placed in the ninth century; Cave assigns to him the date A.D. 990., Lardner, A.D. 950. He wrote commentaries on the *Acts*, on St. Paul's fourteen Epistles, and on the seven Catholic epistles (and perhaps on the *Revelation*), in the form which is called a *Catena* (chain), that is, containing, besides his own observations, the remarks of other writers. Among the authors thus quoted by him are Chrysostom, Cyril of Alexandria, Gregory of Nazianzus, Isidore of Pelusium, Theodoret, and Photius. The best editions of his works are those of Verona, 1532, and Paris, 1631.

(Montfaucon, *Bibliotheca Coisliniana*, pref. and p. 274; Fabricius, *Bib. Græc.*, tom. vii., p. 789; xiii., p. 845; Cave, *Hist. Lit.*, tom. ii., p. 119; Lardner's *Credibility*, in Works, vol. v., p. 154, ed. of 1831.)

OEDENBURG (in Hungarian, *Soprony*; the *Sopronium* of the Romans), the capital of the palatinate of the same name, is situated in a pleasant and fruitful country, amidst extensive vineyards and woods of chestnut-trees. It is about two miles and a half from the south-western part of the lake called the Neusiedler See. The temperature on the banks of this lake is milder than about Oedenburg itself, and the best vineyards are now there. The inhabitants have been celebrated from remote ages for the culture of the vine and the excellence of their wines, but of late years this branch of industry has from some unexplained causes greatly declined, and the wine is very inferior to what it once was.

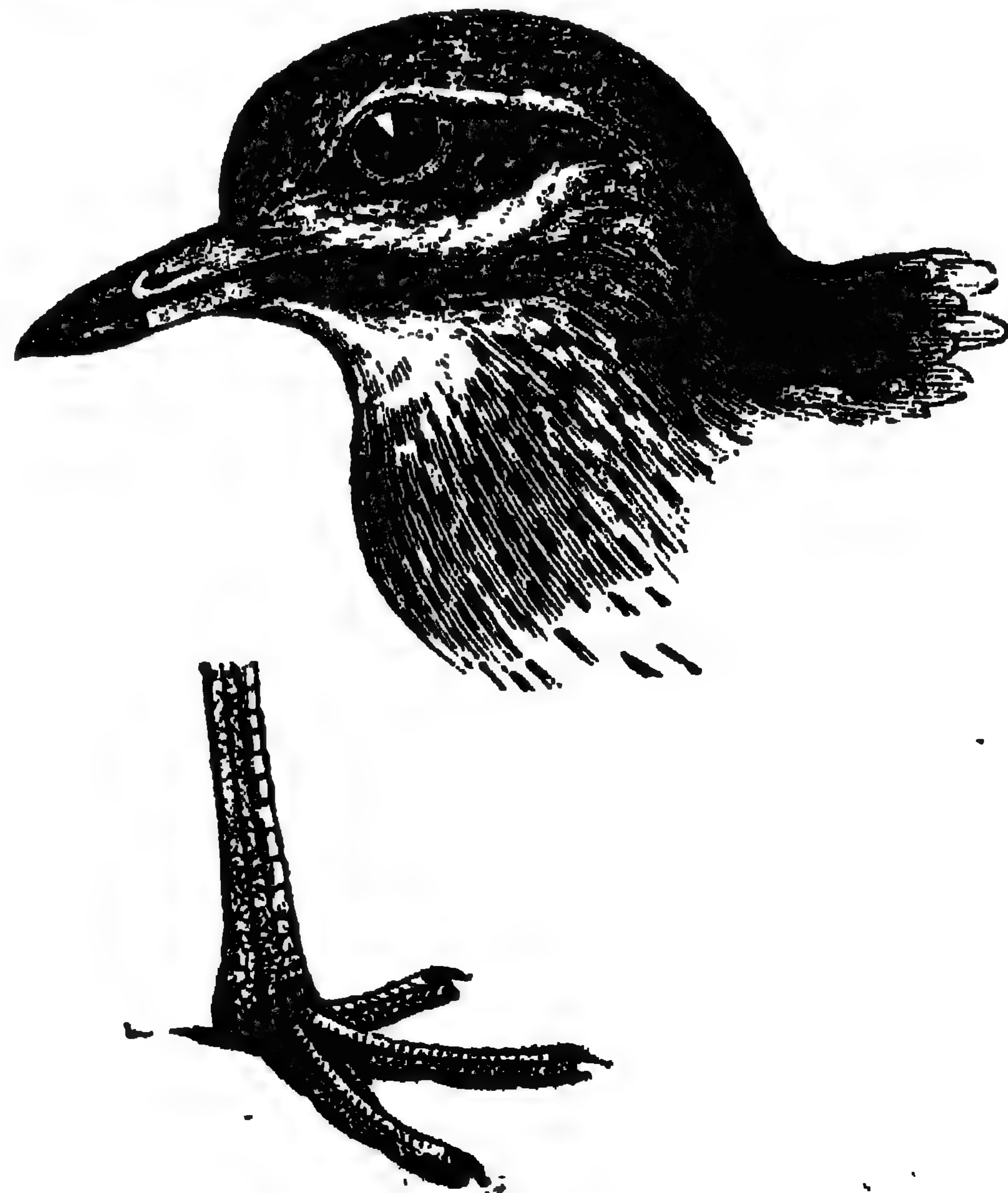
The town itself is not large, but it is regular and well paved; the suburbs are extensive and well built. The inhabitants, 14,000 in number, are Germans, whose ancestors came from Austria and Styria. Among the public institutions are the Roman Catholic chapters, a gymnasium (with 300 scholars) and a school, a Lutheran superintendency with a lyceum (360 pupils), and a Protestant German school (300 scholars). There are also a convent of Dominican monks, one of Ursuline nuns, two Roman Catholic churches, and a Protestant church. The inhabitants manufacture considerable quantities of woollen cloths, playing cards, snuff and tobacco, and sugar. They carry on a great trade in the productions of the country, and have well-frequented cattle-fairs, at which not less than 40,000 head of horned cattle and 150,000 swine are annually sold. In the vicinity there are very extensive coal-mines.

Oedenburg was founded by the Romans, and was the station of the fifteenth legion. Many Roman antiquities, inscriptions, coins, lamps, sarcophagi, &c., have been found in the neighbourhood.

ŒDICNE'MUS (literally, 'thick or swollen leg;' from οἰδ-άνω, to swell, and κνήμη, a leg), Belon's name for an interesting genus among the birds, which seems to be the connecting link between the two great groups of Bustards and Plovers.

Mr. Vigors terminates the family *Charadriadæ* by this form, which, in his opinion, by its affinity with the earlier groups of the *Gruidæ*, connects the former family with that which commences his order *Grallatores*. 'We may also remember,' adds Mr. Vigors, 'that the family of *Struthionidæ*, among the Rasores, is closely allied to the *Gruidæ* of the order before us (*Grallatores*), and equally so to the *Charadriadæ*, in consequence of the absence of the hinder toe. With the latter indeed it is frequently united into one group, from their similarity in this character, and the cursorial habits resulting from it, which are common to both. These three naturally allied families therefore are thus brought into contact, and their mutual affinities preserved; while at the same time they retain in the system the various stations into which the difference in their more important characters tends to separate them.

Mr. Swainson agrees in the main with Mr. Vigors. Linnæus had previously placed the form among the Plovers, and Cuvier had made his family *Pressirostres* consist of the Bustards (*Otis*); the Plovers (*Charadrius*)—which he distributes into two subdivisions, *Œdicnemus*, Temminck; and the Plovers properly so called, *Charadrius — Vanellus*, Bechst., consisting of the *Vanneaux Pluviers* (*Squatarola*, Cuv.) and the True Plovers (*Vanellus*, Cuv.); *Hæmatopus*, *Cursorius*, and *Microdactylus*, the *Cariama* of Brisson (*Dicholophus*), which last leads to the family of *Cultirostres*, composed of the great genus *Ardea* of Linnæus.



Head and foot of Œdicnemus.

M. Temminck, who appears to be the first among the moderns who applied the term *Œdicnemus* to the genus, places it at the head of his *Grallatores;* and M. Lesson, in his 'Manuel,' places it among the *Charadriadæ* (Leach), between *Burhinus*, Ill., and *Himantopus*, Briss.

Mr. Gould, who considers the genus as connecting the Bustards and Plovers, observes that he has often had occasion to remark, that while the normal or typical groups are abundant in species, the aberrant forms, which appear to be created for the purpose of filling up the intervening chasms, are restricted for the most part to a limited number of species: thus while the Bustards and Plovers comprise a vast multitude of species, the genus *Œdicnemus* contains at most but five or six, and these confined entirely to the regions of the Old World. (*Birds of Europe.*)

Generic Character.—Bill strong, nearly straight, rather depressed towards the tip, culmen elevated, lower mandible angulated; *nostrils* longitudinal, pierced through and through the horny part of the middle of the bill, and most open anteriorly. *Tarsi* long. Three *toes*, all before, united as far as the second joint by a membrane which skirts their edges. *Wings* moderate; first *quill* shorter than the second, which is longest.

Example, *Œdicnemus crepitans*, Temm. — *Charadrius Œdicnemus*, Linn.

Description.—All the upper parts of a reddish ashy-brown, with a longitudinal dash on the middle of each feather; space between the eye and the bill, throat, belly, and thighs, pure white; neck and breast slightly coloured with reddish and speckled with longitudinal brown streaks; a longitudinal white band on the wing; towards the middle of the first quill a great white dash, and a very small one on the interior barb of the second; lower tail-coverts ruddy; quill-feathers, except those of the middle, terminated with black; base of the bill bright-yellowish, the rest black; naked skin round the eyes, iris, and feet, pure yellow. Length from the bill to the feet 16 inches 2 lines. *Male* and *Female.*

Such is Temminck's description of the adult bird; but the plumage varies in some individuals. For instance, in the specimen figured and described by Gould, in his 'Birds of Europe,' there is an obscure bar of white above and below the eye, and the ground-colour of the flanks and under surface is stated to be yellowish-white; whilst the yellow toes and feet are noticed as having a tinge of green.

Young Birds.—These have the colours less distinct, and are detected at the first glance by the highly dilated form of the upper part of the tarsus and by the size of the knee-joint. Temminck, who gives this description, adds that this form of the tarsus exists in the *young of the year* of all species of birds with long slender legs, but is particularly remarkable in the young *Œdicnemi.*

This is the *Ostardeau* of Belon; *Le Grand Pluvier, ou Courlis de Terre* of the French; *Gran Pivieri, Curlotte, Ciurlui*, and *Ciurlovi* of the Italians; *Lerchengraue Regenpfeifer, Grosser Brachvogel*, and *Grosse Bragvogel oder Gluth* of the Germans, among whom it is also called, *Triel*, or *Griel*, according to Gesner, who thinks that it is the *Charadrius* of Aristotle; *y Glin-braff* of the ancient British; *Thick-knee, Thick-kneed Bustard, Stone Curlew*, and *Norfolk Plover* of the modern British.

Habits, Food, Reproduction, &c.—Rapid on foot, powerful in flight, which it executes in wide circles, and haunting downs and open places, this species is in general approached with difficulty by the sportsman, though it will often squat in places favourable to its colour, till it is almost trod on. Their shrill evening cry pierces the ear, and may be heard nearly a mile in a still night. Slugs, worms, reptiles, and, some say, mice, are eaten by them; but the two former seem to be their favourite food. White, in a letter to Pennant, dated 30th March, 1768, says, 'I wonder that the Stone Curlew, *Charadrius Œdicnemus*, should be mentioned by writers as a rare kind: it abounds in all the campaign parts of Hampshire and Sussex, and breeds, I think, all the summer, having young ones, I know, very late in the autumn. Already they begin clamouring in the evening. They cannot, I think, with any propriety, be called, as they are by Mr. Ray, "circa aquas versantes;" for with us, by day at least, they haunt only the most dry, open, upland fields, and sheep-walks, far removed from water: what they may do in the night I cannot say. Worms are their usual food, but they also eat toads and frogs.' No nest receives the eggs, which are two or three in number, of a light brown or dirty white, with dusky blood-coloured blotches and streaks. 'It lays,' says the author of the charming history of Selborne, 'its eggs, usually two, never more than three, on the bare ground, without any nest, in the field; so that the countryman, in stirring his fallows, often destroys them. The young run immediately from the egg, like partridges, &c., and are withdrawn to some flinty field by the dam, where they sculk among the stones, which are their best security; for their feathers are so exactly of the colour of our grey-spotted flints, that the most exact observer, unless he catches the eye of the young bird, may be eluded. . . . *Œdicnemus* is a most apt and expressive name for them, since their legs seem swollen like those of a gouty man. After harvest I have shot them before the pointers in turnip-fields.' In his MS. the same author remarks that they seem to descend in the night to streams and meadows, perhaps for water, which their upland haunts do not afford them.

Geographical Distribution.—Europe generally, where it seems to be migratory in many parts, in Britain and Germany for instance. Temminck notes it as abundant in the south of France (in which country Belon found young ones that could not fly at the end of October), Italy, Sardinia, the Greek Archipelago, and Turkey. It is also found in Asia and Africa. It occurred among the Trebizond collection of birds presented to the Zoological Society of London by Mr. Keith Abbott; and the localities attributed to it by Mr. Gould are Europe and Africa, but not India. (*Zool. Proc.*, 1834.) Col. Sykes however had previously recorded it among the birds of the Deccan: at least he says 'there is no visible difference between the Dukhun and British species.' (*Zool. Proc.*, 1832.) If it be the Charadrius Kervari of Hasselquist, which Linnæus and most authors suppose it to be, that traveller describes it as inhabiting Lower Egypt, near the sepulchres, and in the deserts. In Britain it arrives early in the spring. The following is the earliest period recorded by White:—'On the 27th of February, 1788, Stone Curlews were heard to pipe; and on March 1st, after it was dark, some were passing over the village, as might be perceived by their quick short note, which they use in their nocturnal excursions by way of watch-word, that they may not stray and lose their companions. Thus we see that retire whithersoever they may in the winter, they return again early in the spring, and are, as it now appears, the first summer birds that come back. Perhaps the mildness of the season may have quickened the emigration of the curlews this year.' They are seldom seen after the beginning of October; but Markwick states that he received on the 31st January, 1792, a bird of this species which had been recently killed by a neighbouring farmer, who said that he had frequently seen it in his fields (Sussex) during the former part of the winter. This, perhaps, adds Markwick, was an occasional straggler, which, by some accident, was prevented from accompanying its companions in their migration. As the autumn advances, these birds collect into flocks, soon after



Œdicnemus crepitans.

which they leave this country. Norfolk, Suffolk, Kent, and Hampshire seem to be the favourite counties of the Stone Curlew; but it occurs, though rarely, in the Yorkshire Wolds, higher than which it does not seem to go in these islands. Mr. Selby says that he never met with it or heard of it in the more northern English counties, nor in Scotland. It does not occur in Mr. Thompson's Irish list in the 'Zoological Proceedings.'

Utility to Man.—In the hands of a good cook this species is a delicate bird for the table.

In the *Portraits d'Oyseaux*, the following quatrain well describes the bird and the reason for the name given to it by Belon:—

> 'Lon peut nommer cestuy-cy, Ostardeau,
> Parcequ'il est approchant de l'Ostarde,
> Qui sous le ply des genoux l'os regarde,
> Le trouve gros plus qu' à nul autre oyseau.'

OELAND. [ALAND.]

OELS is a lordship, with the title of a principality, in Lower Silesia, and in the Prussian government of Breslau. Together with the principality of Oels Bernstadt, which has been united with it ever since 1745, it has an area of 780 square miles, above 90,000 inhabitants, and a revenue of 18,000*l.* per annum, burdened however with debts of long standing. The soil is in general fertile, and produces much corn, flax, fruit, and also timber, the forests being very extensive. Game and fish are in abundance. The chief town, OELS, situated in 51° 25′ N. lat. and 22° 30′ E. long., in a plain on the river Oelsa, has a population of 6100 inhabitants, who carry on considerable manufactures of woollen cloths: there are likewise extensive breweries. The palace or castle, in which there is a good library, with collections of works of art and natural history, is surrounded with walls and a moat, and has a beautiful park. There are in the town one Roman Catholic and 5 Lutheran churches, 3 hospitals, a Lutheran gymnasium, admirable establishments for the poor, an institution founded in 1821 for the promotion of morality among poor country girls, a theatre, &c. The principality of Oels, after the death of the last duke, Charles Frederic of Münsterberg and Oels, in 1647, came to his son-in-law Duke Silvius Nimrod of Würtemberg, founder of the line of Würtemberg-Oels. This line becoming extinct in 1792, the principality came, through his only daughter and heiress Sophia Frederica Charlotte, to her husband Duke Frederick Augustus of Würtemberg; and after his death, in 1805, to his nephew Duke Frederick William of Brunswick, who fell in the battle of Quatre Bras in 1815, the succession having been secured to him by Frederick the Great in 1785. After his death it devolved to his eldest son and successor Charles, who in 1825 made it over to his brother William, who still possesses it, since he assumed the government of Brunswick in 1830.

ŒNANTHE, a poisonous genus of apiaceous or umbelliferous plants, one of which, the *Œ. pimpinelloides*, appears to have been the οἰνάνθη of Theophrastus and Dioscorides. The species are readily known, independently of other characters, by their fruits being, by the contraction of the rigid pedicels, strongly compacted into heads, the upper side of which is muricated by the stiff straight long styles. The fruits have on each face five convex obtuse ridges, of which the marginal ones are a little the largest.

The species are all inhabitants of damp meadows or watery places, and are common in Europe. The most important is *Œ. crocata*, an inhabitant of ditches, banks of rivers, and similar situations. This plant, which Dr. Christison reckons the most energetic of the narcotico-acrid poisonous plants of its class, has a root of many fleshy fingers, looking exactly like a dahlia-root in miniature, but abounding in an orange-coloured fetid juice, which is also plentiful in other parts of the plant, and in which the deleterious qualities reside. The stem grows from two to five feet high, is much branched, round, and hollow. The leaves are of a dark shining green, doubly pinnate, with wedge-shaped leaflets variously and deeply cut. The umbels are large and convex, of many general, and a still greater number of partial rays. The bracts of the involucre are variable in number and size. The flowers are white, tinged with purple. Cases of accidental poisoning with this plant, in consequence of its roots having been mistaken for ground-nuts, parsnips, &c., by ignorant people, are common. In general death takes place within three hours and a half of the poison having been administered, and often within the first hour.



Œnanthe crocata.

ŒNANTHE. [WHEATEAR.]

OESEL, an island in the Baltic, situated between 58° and 58° 40′ N. lat. and between 21° 40′ and 23° 20′ E. long., stretches across the entrance of the Gulf of Livonia, or Bay of Riga. It extends from south by west to north by east about 45 miles, with an average width of about 25 miles; a narrow peninsula extends from its south-western corner about 20 miles southwards. The area of the island falls short of 1200 square miles: in extent it may be compared with the county of Stafford. The surface is uneven and rocky, but it is covered with a good layer of vegetable mould, and accordingly the island is rather fertile. The highest hills do not appear to exceed 200 feet in elevation. The winters are much less severe than on the adjacent continent. The island produces grain, of which a part is exported, flax, hemp, and a little tobacco. A considerable portion of the island is used as pasture-grounds. The inhabitants, who are Esthonians, amount to more than 30,000. The island belongs to the government of Livonia, or Riga, of which it constitutes the circle of Arensburg, so called from the principal town, which is situated on the southern coast of the island, has a harbour for small vessels, and carries on some trade with Riga in the produce of the island. The population is about 1500. Oesel was early taken possession of by the Danes, who ceded it to Sweden, in 1645, by the peace of Bromsebrö; it remained in the possession of the Swedes till the beginning of the last century, when it was taken by Russia, to which power it was finally ceded, in 1721, by the peace of Nystädt, together with Livonia. The position of this island across the entrance of the Gulf of Livonia renders the navigation of that gulf dangerous in the early part of the spring. When western or north-western winds prevail, the ice which is brought down by the Düna river, being prevented from dispersing in the sea, is accumulated within the gulf, a circumstance which causes loss of life and property.

ŒSOPHAGUS, or gullet, is the canal leading from the pharynx, the short cavity at the back of the mouth, to the stomach. In man, it is composed of two layers of muscular fibres, an external longitudinal layer, and an internal, composed of circular fibres, by which the food is pro

pelled towards the stomach, and which are lined by a layer of soft mucous membrane and a moderately thick cuticle continued from that of the lips and mouth. In many animals its interior is beset with numerous firm pointed processes directed towards the stomach to prevent any food that has passed through it from returning into the mouth; in the ruminants, on the other hand, it is one of the chief means by which the partially digested food is brought again to the mouth for the chewing of the cud.

Œ'STRIDÆ, a family of Dipterous insects of the section *Athericera*, distinguished by the proboscis being either in a rudimentary state or wanting; the palpi are sometimes distinct and occasionally wanting; the antennæ are short, enclosed in a cavity in the fore part of the head; the third joint is usually globular, and the stylet is usually dorsal; the abdomen is generally large; the wings have generally three posterior cells, of which the first is often closed.

It will be seen from the above definition that the Œstri of the moderns cannot be the same as the Œstrus (οἶστρος) of the antient Greeks, a fly, which, we learn from Aristotle (*Hist. Anim.*, iv. 4, &c.), Virgil (*Georgics*, iii. 148), Ælian, and others, is armed with a strong tongue (proboscis), pierces the hides and sucks the blood of quadrupeds, and makes a peculiar kind of harsh humming noise. Mr. Bracy Clark states that the *Œstrus bovis* makes no noise whilst flying, and Mr. W. S. M'Leay says, 'the *Œstrus equi* is also silent in flying, as I have repeatedly myself observed.' The absence in some and the rudimentary state of the proboscis in others of the modern *Œstri* proves that they are not blood-suckers; and this fact is otherwise at variance with the description given by the antients, their *Œstri* having a strong proboscis, a circumstance which, connected with the blood-sucking habits of the *Tabanidæ*, another family of Dipterous insects, induces Mr. M'Leay to imagine that the Œstrus of the antients belongs to that group. An ingenious paper on this subject, by the gentleman last mentioned, will be found in the 14th volume of the 'Linnæan Transactions.'

The modern *Œstridæ* are certain flies (whose larvæ are well known by the name of bots) which deposit their eggs on the body of various herbivorous quadrupeds, so that the larva when hatched shall find itself in the neighbourhood of its appropriate food, either in the hide of the animal, in its stomach, or elsewhere. Each species of *Œstrus*, almost invariably confines its attacks to a certain species of quadruped, and finds its nutriment in the same part or nearly the same part of that quadruped; from this circumstance the species are often named after the animal of which each is a parasite.

The larvæ of the Œstri are usually of a conical form, and the segments of the body are generally furnished with spines; the organs of respiration are situated at the posterior extremity of the body, which is the largest; the mouth, which is situated at the opposite extremity, in some consists of soft mamillæ, whilst in those species which derive their nutriment in the stomach of an animal or in such a situation that they would be liable to be dislodged, the mouth is furnished with two hooks for prehension; these hooks are curved outwards, so that when once inserted they retain their hold without any exertion on the part of the insect.

These larvæ are divided by Latreille, according to the situations which they inhabit, into *cutaneous*, *cervical*, and *gastric*, as some live in the tumours formed on the skin, others in some part of the interior of the head of the animal attacked by them, and the last in the stomach. 'The eggs of the first,' says Latreille, 'are deposited by the parent under the skin, by means of a squamous ovipositor, composed of four tubes fitting one within the other, and armed at the end with hooks and two other appendages. This instrument is formed by the last annuli of the abdomen. These larvæ are not compelled to change their domicile, finding themselves, when hatched, in the midst of the purulent matter on which they feed. The ova of the others are simply deposited, and glued to various parts of the skin, either in the vicinity of the natural cavities into which the larvæ afterwards penetrate and take up their abode, or on those spots which the animal is in the habit of licking, by which means the larvæ are conveyed by the tongue into the mouth, whence they are carried with the food into the stomach, to the coats of which they attach themselves.' Mr. Bracy Clark thinks the food of these is most probably the chyle, which, being nearly pure aliment, may go wholly to the composition of their bodies, without any excrementitious residue. When full grown, they pass with the digested food, and falling to the ground, they seek some convenient retreat, in which they assume the pupa state and undergo their final transformation. A detailed account of the habits of several of the species of Œstri will be found in the article BOTS.

In the most modern work on dipterous insects* the following seven genera are enumerated as belonging to the family *Œstridæ*.

Genus 1. *Cuterebra* (Clark). Distinguishing characters: head somewhat swollen in front; buccal cavity triangular; proboscis very small and retractile; third joint of the antenna ovate; stylet plumose; joints of the tarsi provided with tolerably large pads. Two species of this genus are found in North America, the *Cuterebra cuniculi* and *C. buccata*; their larvæ are parasites on the hares and rabbits. A third species is found in Cayenne, the *C. ephippium*.

2. *Hypoderma* (Clark) has the proboscis indistinct; a small Y-shaped buccal opening; no distinct palpi; the third joint of the antenna is very short and transverse. To this genus belongs the Œstrus which attacks the ox (*Hypoderma bovis*), the larva of which lives in the hide of that animal.

3. *Œdemagena*. This genus has the buccal opening linear, and enlarged above; it has no proboscis; the two palpi are placed near together and are two-jointed, the second joint is large, orbicular, and compressed; the claws and pads of the tarsi are large. Only one species of this genus is known, the *Œdemagena tarandi*, and this is found in Lapland. The female fly deposits her eggs on the back of the rein-deer, and the larvæ live in the hide of that animal.

4. *Cephenemyia* has a very small rounded proboscis, above which the palpi are inserted close together; they are two-jointed, and the second joint is globular; the third joint of the antennæ is compressed, and the stylet is inserted at its base. The body is broad and rounded. *Cephenemyia trompe* is found in Lapland; its larva lives in the frontal sinus of the rein-deer. Since the same fly however is found in Saxony, where there are no rein-deer, the larva must find its nutriment likewise in some other animal.

5. *Cephalemyia*. In this genus the body is but sparingly clothed with hair, the head is very large and rounded in front; there are no cheek cavities; the palpi are wanting, or at least are only represented by two small tubercles; the stylet of the antenna is apical; the wings have two posterior cellules.

But one species of this genus is recorded, the *Cephalomyia ovis*. The female fly deposits her eggs in the nose of the sheep, and the larvæ live in the frontal sinus.

6. *Colax*. Here there are likewise no buccal cavities; the antennæ are distant from each other and inserted near the eyes, the stylet is terminal; the wings have four posterior cellules; the first posterior cellule is short and open, the third is closed, and the anal is long.

The only species hitherto discovered belonging to this genus is found in Brazil; its habits are unknown. It is the *Colax macula* of Wiedemann.

7. *Œstrus*. This generic name is now confined to such species of the *Œstridæ* as have no buccal cavity; the palpi wanting, or represented only by minute tubercles; the wings are decumbent, and have the first posterior cellule entirely open.

To this genus belongs the Œstrus whose larva or bot is found in the stomach of the horse, the *Œstrus equi*. The larvæ of two other species (*Œstrus hæmorrhoidalis* and *Œstrus salutaris*) are also found in the stomach of the horse.

The *Œstrus pecorum* (a species found in Sweden), when in the larva state, is found in the intestines of the ox.

The larva of another species, the *Œstrus nasalis*, is said to live in the œsophagus of the horse, the ass, the mule, the stag, and the goat.

ŒTA, MOUNT. [GREECE; THESSALY.]

ŒTHRA, Dr. Leach's name for a genus of Brachyurous Crustaceans, placed by M. Milne Edwards as the representative of his first division (*Cancériens Cryptopodes*) of his tribe *Cancerians*; and indeed his Cryptopod Cancerians are composed of this genus solely. Latreille made *Œthra* and

* 'Histoire Naturelle des Insectes Diptères,' by M. Macquart, in two volumes, forming part of the 'Suites à Buffon.'

Calappa [CALAPPA] form the family *Cryptopoda;* but M. Milne Edwards is of opinion that the only character which they have in common with the latter is the existence of lamellar prolongations on the sides of the carapace, dispositions which are also found in certain *Leucosians*, whilst all the rest of their organization approaches that of the *Crabs*.

Œthra.

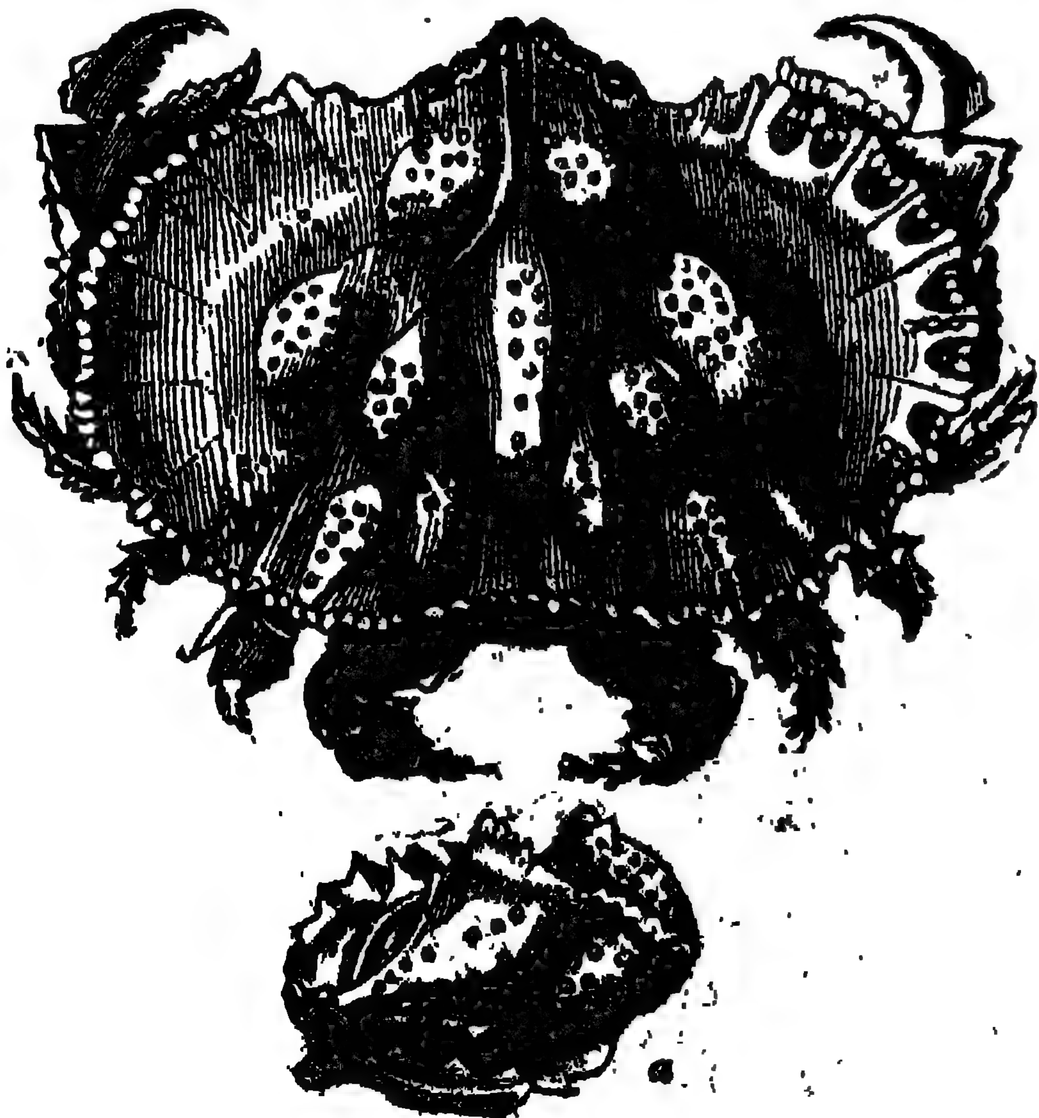
The whole surface of the body rugged and appearing as if eroded. *Carapace* a third wider than it is long, oval, strongly knobbed above, and with the lateral borders strongly dentilated and a little curved upwards. Front entire and a little more projecting in the middle than on the sides. *Eyes* very small, the orbits nearly circular, their upper border with two small fissures, and the lower border separated from the front by a very large gap. *Antennary fossets* nearly square, and the basilary joint of the *internal antennæ* filling them almost entirely; the moveable stem of these appendages very small, and bent longitudinally forwards. Basilary joint of the *external antennæ* very large, and advancing up to the lower border of the front, so as to fill the gap which would otherwise make the orbit communicate with the antennary fosset; its anterior extremity very narrow and upon the edge of the inferior orbital border; second joint of the external antennæ very small, occupying the internal *canthus* of the eyes, and supporting a stemlet which is rudimentary and very difficult to distinguish. *External jaw-feet* completely closing the buccal frame; the internal border of their second and third joints straight: this last portion is strongly truncated at its posterior and internal angle, and hides almost entirely the palpiform stemlet which has its origin under its anterior and internal angle. *Sternal plastron* much longer than it is wide. Anterior *feet* about once and a quarter as long as the post-frontal portion of the carapace, and of nearly the same form as in *Parthenope*, excepting that their upper and internal surface is slightly concave, so as exactly to fit the lower and anterior portion of the trunk; second pair of feet much shorter than the post-frontal portion of the carapace; the other pairs successively diminishing in length, and all surmounted with a sharp and unequal crest. *Tarsus* short and styliform. *Abdomen* with seven segments in the female and five only in the male.

Place in the System.—M. Milne Edwards is of opinion that this form has great affinity with the genus *Cryptopodia* belonging to the family of *Oxyrhynchs*, and that it establishes the passage between those crustaceans and the other *Cancerians*, at the same time that it approaches *Calappa*, whose natural place is in the family of *Oxystomes*.

Geographical Distribution of the Genus.—East Indian and African Seas.

Example, *Œthra scruposa*. Length 2 to 3 inches. Colour greyish.

Locality.—Isle of France and Indian Archipelago.



Œthra scruposa.
a, the right pincer, external view.

OETTINGEN, formerly an independent in the north part of Swabia, now belongs partly to Bavaria and partly to Würtemberg. Its area is 372 square miles; and the population above 61,000. It is a very fertile country, watered by the rivers Wernitz and Eger, and produces corn, hemp, flax, and timber. It has a good breed of horned cattle and horses, and is particularly famous for its geese. It abounds in fact in all the necessaries of life except salt. It has likewise iron, saltpetre, and remarkably fine stone for building. The county is now divided between two princes, whose common ancestor, Lewis XV., lived at the time of the Reformation; of his two sons, Lewis XVI. founded the Protestant and Ferdinand the Roman Catholic branch: the former, which obtained in 1674 the rank of prince of the empire, became extinct in 1731; the latter was divided by the three sons of William the Elder into three branches—Oettingen-Spielberg, which obtained the princely dignity in 1734; Oettingen-Wallerstein, which succeeded by will to the possessions of the extinct Protestant line, and obtained the princely dignity in 1774; and Oettingen-Baldern, which is now likewise extinct.

Oettingen-Oettingen, or Spielberg, in the circle of the Rezat in Bavaria, is 84 square miles in extent, and contains about 15,000 inhabitants. The prince resides in the town of Oettingen on the Wernitz, in 48° 57′ N. lat. and 10° 38′ E. long. The inhabitants, 3280 in number, are half Protestants, half Roman Catholics; there are 250 Jews. It is a well built town, has two palaces, a gymnasium, an elegant Lutheran church, a Roman Catholic church, a literary society, an orphan asylum, and manufactories of cotton, linen, and worsted.

The prince of Oettingen-Wallerstein has a territory of 252 square miles, partly in Würtemberg, partly in Bavaria, with 46,000 inhabitants. Wallerstein, the capital and residence of the prince, is a well built market-town, with 1500 inhabitants. The prince's palace is a handsome building, and contains a good library and a collection of paintings.

OFEN. [BUDA.]

OFFENBACH is the capital of a circle in the province of Starkenburg, in the grand-duchy of Hesse, and belongs to the mediatised princes of Isenberg-Berstein. It is situated in a very pleasant and fertile country, about a league from Frankfort, on the bank of the Maine, over which there is a bridge of boats: it is surrounded on one side with a wall, on the other by a navigable canal which joins the Maine. It consists of the old and the new town, the latter of which is well built. The public buildings are a fine palace, a Lutheran, a French Calvinist, and 2 Calvinist churches, and a gymnasium. The population is 8000. Offenbach is the only considerable commercial and manufacturing town in the grand-duchy. The manufactures are, very various: the principal are leather, hats, silks, hosiery, earthenware, all kinds of lacquered goods, gold and silver wire, jewellery, snuff and tobacco, wax candles, white-lead, chocolate, and carriages, which are much esteemed all over Germany for lightness and durability.

OFFICE FOUND. By the common law of England, where the king is entitled, upon the occurrence of certain events, to take possession of real or personal property previously belonging to a subject, the facts upon which the king's title accrues must be first ascertained by an inquisition or inquest of office. This inquiry is executed by some officer of the crown, such as the escheator, coroner, or sheriff, or by persons specially commissioned for the purpose, and the facts are ascertained by a jury of an indeterminate number, but consisting usually, though not necessarily, of twelve men. Such inquests were much more frequent before the abolition of military tenures, when inquisitions *post mortem* were instituted upon the death of any of the king's tenants, to inquire of what lands he died possessed, and of other matters tending to establish the king's rights respecting the property of the deceased. [JURY.] When an inquisition of this kind has been executed and returned, it is said to be *an office found.* Thus where treasure has been discovered under circumstances which do not give it to the owner of the land, an inquest is held, and the king, upon office found, takes it; and where a person of illegitimate birth dies intestate, the king (if he is the immediate lord of the fee), upon office found, is entitled to all his land: in the latter case however the land is generally granted again to some person or persons who can make out the most reasonable claim to it. So also the verdict of a jury upon a coroner's inquest, declaring a person to have died *ut felo de se*, is an office found, upon which

the king becomes entitled to take possession of the property of the deceased.

OFFICE, HOLY (*Sanctum Officium*), is the name of an ecclesiastical tribunal established in the thirteenth century by popes Honorius III., Gregory IX., and Innocent IV., to try heretics, blasphemers, apostates, relapsed Jews or Mohammedans, witches and wizards, polygamists, and other persons charged with infractions of the canons of the Church. The judges of this court were called inquisitors, whence the tribunal itself has been commonly styled the 'Holy Inquisition.' The name of inquisitors, or inquirers after heretics, appears as early as the reign of Theodosius I., who, by his constitution against the Manichæans and other heretics, A.D. 382, after adjudging the punishment of death for several aggravated cases of heresy, directs that 'Inquisitores ad conquirendos et eruendos hereticos' be appointed by the prefect of the Prætorium. (*Codex Theodosianus, Gothofredi*, xvi., tit. 5, lex 9.) This is the first law under the Christian emperors by which the punishment of death is awarded for heresy. Constantine had only sentenced the Arians to banishment, though he threatened to punish with death those who should retain and make use of the books of Arius. The subsequent law of Honorius, A.D. 398, expels from the towns the 'Clerici' or priests of the Montanists and Eunomians, and if they persist in bringing people together, it banishes them for life. It further orders their books to be burnt, and condemns all persons who are found to conceal them to be beheaded. (*Cod. Theod.*, xvi., tit. 5, l. 34.) Two more constitutions or laws of Honorius (51 and 56 of the same book and title in the Theodosian Code) threaten with proscription and death those who publicly profess certain heresies. These are the oldest laws on record which make heresy a capital crime; but it ought to be observed, that there is no law in the whole Theodosian Code which subjects heretics in general to the pain of death, that punishment being reserved for the leaders, those who collected assemblages of people, made proselytes, and preached or spread certain heterodox doctrines specified and condemned by the laws. The trial and punishment in all such cases were left to the civil magistrate.

Previous to the time of Theodosius I. there had been persecutions of Arians by the Orthodox, and *vice versâ*, carried on through the violence of individuals; but there was no specific law making heresy a capital offence. Towards the heathens the case was different. Constantius (A.D. 353) had forbidden heathen sacrifices under pain of death. Theodosius I. confirmed that law, and Theodosius II., after remitting the capital penalty (A.D. 423), put it in force again in 426. (Gothofredus, *De Statu Paganorum*.) Most of the earlier fathers, Tertullian, Cyprian, Lactantius, Hilarius, Ambrose, and Gregory Nazianzenus, and even Athanasius, openly disclaim violence as a means of enforcing unity and obedience to the Church. Chrysostom and Augustin however think that heretics ought to be prevented from holding assemblies, and ought to be confined or banished, but not put to death. But it ought to be remembered that the heretics of those times, the Arians and Donatists in particular, constituted political factions which rebelled against the authority of the state, murdered their antagonists, demolished their houses, and committed all sorts of violence, as may be seen by the letters of Augustin.

The first person on record who was juridically condemned and put to death for heresy is Priscillianus, the leader of a sect in Spain, in the latter part of the fourth century. Two Spanish bishops, one of whom was called Idacius, accused Priscillianus, with two other priests or bishops, before a council held at Bordeaux, A.D. 385. Priscillianus appealed to the emperor Maximus, who had assumed the imperial purple in Gaul, and who was then residing at Treves, whither Priscillianus and his friends were taken, being followed by their prosecutor Idacius. Martin, bishop of Tours, interceded in their behalf; but after his departure from Treves, Maximus entrusted Evodius, the prefect of the Prætorium, with the trial of the accused, and upon his report Maximus condemned them to be beheaded. This novelty was generally censured, and Ambrose and Martin of Tours strongly reprobated the part which Idacius had acted, and which they characterised as unbecoming the episcopal character. The consequence was, that Idacius was excommunicated, and died in exile.

Justinian, in the first book of his Code, in which he treats of the Catholic faith, and defines its creed according to the first four general councils, of Nicæa, Constantinople, Ephesus, and Calchedon, forbids public disputations upon dogmas, and enacts several penalties against heretics, Jews, and apostates. In the 131st Novel, the same emperor says: 'We receive the doctrines of the four Holy Synods as the Divine Scriptures, and their Canons we observe as laws.' Thus the orthodox creed, as expounded in the four councils, became the law of the empire, an empire which was then administered despotically, and dissent from that creed was an offence against the law. From this principle the whole penal code against heretics was derived. But for several centuries after, cases of heresy were tried and penalties awarded by the ordinary courts, as the bishops had not then any temporal jurisdiction. In course of time however councils interfered, and after condemning particular tenets as heretical, specified in some instances the punishments to be inflicted upon heretics, Jews, and apostates. [JEWS.] It became the practice for the bishops to examine the accused, and decide whether there were sufficient grounds for the charge of heresy against them; if the charge was proved, they were to admonish them, and convince them of their errors, after which, if the accused remained obdurate, the bishop handed them over to the secular court. 'Heretici perseverantes in errore relinquantur Curiæ secularis judicio.' (Council of Tarracona, A.D. 1242.) And the law of Las Partidas, which is still the fundamental code of Spain, promulgated in 1258, says: 'Heretics may be accused by any one of the people before the respective bishop or his vicar, who must examine and interrogate them upon the various articles of the faith, and if they find that they err in them or in any other thing which the church of Rome commands to be believed and observed, he must endeavour to convert them and make them forsake their errors by means of good arguments and mild words. And when the penitents have acknowledged their belief, they are to be reconciled to the church and be forgiven. But if it so happens that they will not forsake their errors, the bishop must convict them as heretics, and then hand them over to the secular or lay judges.' The lay judges however were not mere executors of the episcopal verdict: they examined the proceedings, and having convinced themselves of their regularity, they awarded the penalty. By a clause of the same law of Las Partidas, 'the property of those who are condemned as heretics, or who die in the heretical belief, belongs to their children or other descendants.' The principle of confiscation is here not recognised. This was in the kingdom of Castile; but in Aragon, France, and Italy, a different process was introduced by means of the Inquisition.

In the council of the Lateran, convoked at Rome in 1215, by Innocent III., new and severe enactments were made against heretics, but the cognizance of matters of heresy was left to the ordinaries or bishops. But some years before this time, Innocent himself, of his own authority, had sent a commission consisting of two legates, who were Cistercian monks, accompanied by subordinate priests and officers, to the south of France, in order to extirpate the heresy of the Albigenses. These legates acted independently of the local bishops; they held their own court, before which they summoned, by the authority of the pope, individuals accused of heresy, and condemned, and inflicted penalties, and even capital punishments. Dominic de Guzman, the founder of the order of Dominicans, was one of the most zealous agents of this commission, the members of which were called Inquisitors. This however was only a temporary and local commission.

In 1208, Peter de Castelnau, one of the legates, who had become obnoxious for his severity, was murdered near Toulouse, and Innocent was so exasperated, that he preached a crusade against the Albigenses, which, after a long struggle, ended in their extermination. [ALBIGENSES.] Honorius III., the successor of Innocent, issued new provisions against heretics, which were enforced by the emperor Frederic II. in three constitutions, or laws, dated Pavia, A.D. 1224, by which he condemned impenitent heretics to death, and those who repented to perpetual imprisonment. In the year 1228 a severe penal law against heretics was enacted in the city of Milan by Cardinal Godfrey of St. Mark, papal legate, with the consent of the archbishop and the people; it was to the effect that 'no heretic should be allowed to remain in the state of Milan; that any person might lay hands on a heretic and bring him before the magistrates; that those who were convicted as heretics by the Ecclesiastical Court should be executed by the prætor within ten days,

their houses pulled down, and their property confiscated to the community.' (Calchi, *Historiæ Patriæ*, b. xiii.; Corio, *Storia di Milano*, part ii., p. 72; Verri, *Storia di Milano*, ch. ix.) No less than fifteen sects of heretics, with strange names, are enumerated by these historians as having been discovered within the state of Milan. The archbishop of Milan at the time was Enrico da Settala, who exerted himself greatly in rooting out the heretics, and having probably exceeded all bounds, he was at last banished by the council of the republic, for which the council and the podestá were excommunicated by the pope. In the inscription on the tomb of this archbishop, it was stated that 'being appointed inquisitor, he destroyed the heretics.' It was about the year 1233 that Pope Gregory IX. laid down the rules and defined the jurisdiction of the inquisitors' courts, which he sent to various countries, under the name of Inquisitorial Missions. He appointed as chief inquisitor in Lombardy, Pietro da Verona, a Dominican monk, who was strenuously seconded by the then podestá of Milan, Oldrado da Tresseno, who consigned to the flames numerous heretics. The likeness of this podestá was, not many years since, and probably is still, seen sculptured in relief in the façade of the hall of the municipal council at Milan, with an inscription recording, among other things, that he had burnt the heretics as in duty bound: 'Catharos, ut debuit, uxit.' The chronicler Fiamma says, that he was the first who put heretics to death in Milan. By degrees inquisitors were sent by the popes to most Italian cities and states, where, with the consent of the local authorities, they established their tribunal, and had their officers, notaries, informers, and other agents. Dominican monks were generally employed as inquisitors, as the principal object of the institution of their order was to defend the orthodox faith by arguing and preaching against heresy, on which account they are styled 'Fratres Prædicatores,' or brother preachers. The inquisitor Pietro da Verona, in the course of nineteen years, burnt a great number of heretics throughout Lombardy, banished or frightened away a still greater number, and confiscated their property. A certain Confaloniere of Alliate, being warned that he was on Fra Pietro's list, conspired with several of his friends, who lay in wait for the inquisitor, and on the 6th of April, 1252, as he was returning from Como to Milan, in company with another Dominican, they killed him near Barlassina, and wounded his companion, who died a few days after. The inquisitor was shortly after canonized by Pope Innocent IV., under the title of St. Peter Martyr. In 1277, another Dominican, brother Pagano da Lecco, was killed in the same manner in Valtellina.

The chroniclers of the various cities of Lombardy record the acts of the inquisitors, and the number of heretics and witches whom they put to death at particular times. The chronicle of Muralto states that brother Antonio da Casale, inquisitor of Como, in 1416, sent three hundred heretics to the stake in one single year. Tartarotti states that in the year 1485 forty-one witches were burned at Como. Bartolomeo Spina, 'De Strigibus,' ch. 13, states that in the diocese of Como the number of those who were tried annually by the Inquisition exceeded one thousand; that the inquisitor employed eight, ten, and even more vicars, and that almost every year about one hundred persons were burned. (*Lettere del Conte Gianbattista Giovio all' Abate Bettinelli*, letter vi.)

The Inquisition was introduced into Rome as well as other parts of Italy by Gregory IX., and entrusted to the Dominicans, but it was a long time before it was established as a distinct and permanent court. Inquisitors were appointed by the pope on particular occasions, who visited the various provinces and towns, proclaiming to all persons the obligation they were under of informing against those whom they knew or suspected of being heretics, under pain of excommunication. At the same time they also made it known that all persons guilty of heresy who came of themselves before the inquisitor within a certain fixed period, and accused themselves and professed repentance, should receive absolution and be only subject to a canonical penance. These penances were public, humiliating and very severe, as may be seen by a letter of St. Dominic concerning a heretic whom he had converted, by the acts of the council of Besiers, A.D. 1233, and of the council of Tarracona in 1242. After the expiration of the period of grace, the inquisitor proceeded *ex-officio* against those who were denounced, the name of the informer being kept secret: he examined witnesses privately in presence of a notary and two priests, and having taken down the evidence in writing, he read it over to the witnesses, who were asked whether they confirmed what had been read. If there appeared to be sufficient grounds for proceeding against the accused, the inquisitor ordered his arrest by the municipal officers, and he was taken to the convent of the Dominicans, if there was one in the town, or to the prison of the ecclesiastical court. He was then interrogated by the inquisitor, and his answers might be used afterwards as evidence against him. If the accused denied the charge of heresy, he was supplied with a copy of the instruction and depositions, but without the names of the accuser and witnesses, and with the omission of such circumstances as might discover them. The accused having made his answer or defence, which was taken down in writing, if he denied the charges, the inquisitor, together with the bishop of the diocese or his delegate, if they thought proper, ordered him to be put to the torture in order to obtain his confession. The torture might be repeated three times, but it was afterwards ordered to be applied only once; this regulation however was often evaded by suspending the torments and then resuming them, and considering the whole as one torture. If in the end there were not sufficient grounds for the conviction of the prisoner, he was declared to be 'suspected of heresy,' was obliged to make a public abjuration of all heresies, and was subject to certain penalties, according to the nature of the case. If the accused was convicted of heresy, but professed his repentance, he was condemned to prison for life, a penalty which however might be mitigated by the inquisitor. But if he was a *relapsed*, that is to say, had been tried before, and found guilty or only strongly suspected, there was no mercy for him; he was 'relaxatus,' that is to say, given over to the lay magistrate, who, according to the civil and canon laws, was bound to put him to death upon the sentence of the inquisitor which declared him a heretic. The only favour shown to the relapsed heretic who confessed and abjured his guilt was, to be strangled before he was burnt. If the convicted heretic was not relapsed, but impenitent, a respite of the sentence was granted in order to effect his conversion, and if he at last abjured, his life was spared, and he was sentenced to perpetual imprisonment. If he persisted in his impenitence, he was publicly burned alive. Such were the principal characteristics of the old or delegated Inquisition as it existed from the thirteenth century to the latter part of the fifteenth, and the regulations of which are found in the 'Directorium Inquisitorum' of Friar Nicholas Eymeric, a native of Catalonia, and a Dominican monk of the fourteenth century, who held the office of chief inquisitor in Aragon for forty-two years.

The Inquisition had nearly fallen into disuse in the kingdom of Aragon in the fifteenth century, in consequence of the total extinction of the heretical sects in the south of France, whose spreading on the other side of the Pyrenees had occasioned the introduction of the inquisitional courts into Catalonia and Aragon. In the kingdoms of Castile and Leon and of Portugal, the Inquisition had not yet taken permanent root. But towards the end of the fifteenth century, the Holy Office was introduced into Spain under a new and more appalling form, and became consolidated and permanent, and more absolute and independent than in any other country of Europe. This is what is designated by Llorente and other writers by the name of the 'Modern or Spanish Inquisition.'

Alfonso de Hodeja, prior of the Dominican convent of Seville, and Friar Philip de Barberis, inquisitor of the kingdom of Sicily, which was then subject to the crown of Aragon, suggested to Ferdinand and Isabella, in 1477, the establishment of the Inquisition in Spain for the purpose of punishing those Christians who secretly relapsed to the Jewish faith. The converts, or children of converts, from Judaism, were looked upon with dislike and mistrust by the old Christians; and many of them were at the same time among the wealthiest merchants and monied men of Spain, and as such had numerous debtors. Reports were spread of their secret meetings with those who had remained Jews, of their profaning the images of Jesus Christ, and even crucifying Christian children. Ferdinand easily listened to the suggestion; but Isabella, a princess of mild character, hesitated for some time, and without her consent nothing could be effected in the dominions of the crown of Castile. Means were at last found to alarm her conscience: she was told that the interests of religion

required her acquiescence, and accordingly she solicited, by means of her ambassador at Rome, a Papal bull, authorising the establishment of the Inquisition in the kingdom of Castile. The bull, despatched from Rome in November, 1478, authorised Ferdinand and Isabella to appoint two or three bishops or other dignitaries of the church, aged at least forty years, of irreproachable character, graduates in theology and the canon law, who were to be commissioned to seek after and discover, throughout the dominions of the Spanish sovereigns, all apostates, heretics, and their abettors, with full power to proceed against them according to law and custom. Isabella however suspended the execution of the bull for two years, desiring at the same time that measures of persuasion should be adopted to warn the relapsed converts of their error and of their danger. A catechism was composed expressly for them, and several pamphlets against Judaism were issued. In 1480 the Cortes of Castile assembled at Toledo, and passed several restrictive measures against the Jews, with the view of checking their intercourse with the Christians. Nothing however was said in that assembly about the Inquisition. At last, in September, 1480, Ferdinand and Isabella, who were then staying at Medina del Campo, appointed two Dominicans as inquisitors, with an assessor and a fiscal attorney; and on the 9th of October a royal order was despatched to the governors of provinces to furnish the new inquisitors and their retinue with everything necessary for their journey to Seville; and at the same time their privileges were declared, which were the same as those granted by the emperor Frederic II. to the inquisitors in Italy in the thirteenth century. The inquisitors established their court in the Dominican convent of St. Paul of Seville, whence, on the 2nd of January, 1481, they issued their first edict, by which they ordered the arrest of several 'new Christians,' as they were styled, who were strongly suspected of heresy, and the sequestration of their property, denouncing the pain of excommunication against those who favoured or abetted them. The number of prisoners soon became so great, that the Dominican convent not being large enough to contain them, the court was removed to the castle of Triana, in a suburb of Seville. The inquisitors issued another edict, by which they ordered every person, under pain of mortal sin and excommunication, to inform against those who had relapsed into the Jewish faith or rites, or who gave reason for suspecting them of being relapsed, specifying numerous indications by which they might be known. Sentences of death soon followed; and in the course of that year, 1481, 298 new Christians were burnt alive in the city of Seville, 2000 in other parts of Andalusia, and 17,000 were subjected to various penalties. The property of those who were executed, which was considerable, was confiscated. (Mariana, *Hist. de España*, b. 24, ch. 17.) The terror excited by these executions caused a vast number of new Christians to emigrate: several who were condemned as contumacious repaired to Rome, and appealed to Pope Sixtus IV. against the inquisitors. The pope wrote to Ferdinand and Isabella, in January, 1482, complaining of the arbitrary conduct of the two inquisitors appointed by them, revoking the authority which he had given to their majesties to appoint other inquisitors, and reserving that right to himself, which he exercised by a brief in the following February. Among these new appointments was that of the afterwards famous Torquemada. Queen Isabella now wrote to the pope, requesting him to give a permanent and fixed form to the new tribunal, and to make its judgments definitive without appeal to Rome, complaining at the same time that she was accused of doing all that she had done in favour of the Catholic faith, for the sake of the confiscations which follow the condemnations. The pope laid the proposal of Isabella before a committee of Spanish cardinals and bishops who were then at Rome, and among whom was Rodrigo de Borja, afterwards pope Alexander VI. By their advice Sixtus IV. despatched a brief to Isabella, appointing Manrique, archbishop of Seville, to be apostolic judge of appeal for all Spain, with power to decide on all appeals from the judgments of the Inquisition. By several other briefs, directed to the various archbishops of Spain, the pope gave them the power and regulated the manner of appointing the ordinary inquisitors in the various dioceses. Notwithstanding these measures, appeals from Spain continued to be received at Rome; and the pope again wrote, in August of the same year, to the archbishop of Seville, ordering the proceedings against several individuals to be quashed, and recommending mildness and moderation. This recommendation however had no effect. Soon after, the pope appointed Thomas de Torquemada, prior of the Dominican convent of Segovia, to the new dignity of inquisitor-general of the kingdom of Castile; and by another brief, dated 17th October, 1483, he made him likewise inquisitor-general of the kingdom of Aragon, with full jurisdiction over all other inquisitors in Spain and its dependencies. His powers were confirmed by Innocent VIII., in February, 1486. Torquemada chose for his assessors and councillors two jurists, J. Gutierrez and Tristan de Medina: he created four subordinate courts, at Seville, Cordoba, Jaen, and Villa Real; the last was soon after transferred to Toledo. The Dominican monks, who had been appointed inquisitors by the pope in February, 1482, at first refused to submit to the authority of Torquemada, but they finally yielded. Ferdinand at the same time appointed a royal council of the supreme Inquisition, 'Consejo de la Suprema Inquisicion,' of which the grand-inquisitor was president of right and for life, and a bishop and two doctors-at-law were councillors. The councillors had a deliberative vote in all matters of civil law, but the president alone judged in matters which concerned the canon or ecclesiastical law.

Torquemada and his two assessors framed the organic laws of the new tribunal, which were styled 'Instructions,' and were partly based on the older 'Directorium Inquisitorum' of Eymeric. Being sanctioned by a junta of the inquisitors of the four courts which he had established and of the royal councillors, the instructions, consisting of 28 articles, were promulgated at Seville, the 29th October, 1484. They are given at length by Llorente, in the sixth chapter of his History. New articles were added to them in 1488 and 1498, and lastly the inquisitor-general Valdez, in 1561, compiled a new series of ordinances in 81 articles, which regulated ever after the practice and proceedings of the Spanish Inquisition. They are also given by Llorente, in the 22nd chapter of his work. They are substantially the same as those already noticed as being in practice by the old Inquisition, but are more minute, and rather more unfavourable to the accused. By the old practice, for instance, the names of the witnesses for the prosecution were in many cases communicated to the accused, to whom they were of great use for his defence. Confiscation of the property of those who were condemned was not generally enforced under the old practice, and this was more particularly the case in the kingdom of Aragon, a circumstance which explains the resistance of the Aragonese, among whom the old or delegate Inquisition had been established for centuries, to the introduction of the new Inquisition as instituted by Torquemada.

Another important characteristic of the new Spanish Inquisition was its compact organization and independence of all other authorities. The inquisitor-general was appointed for life; he was proposed by the king and approved by the pope. He appointed all other inquisitors under him, as well as visitors and other agents. He had full and discretionary power by the papal bulls in all matters of heresy. The grand-inquisitor, being thus placed as a distinct power between the king and the pope, was in reality independent of both. He could refuse to submit to those papal decretals and bulls which he did not approve, by alleging that they infringed upon the rights of the Spanish monarchy; and he could likewise evade the king's ordinances, by alleging the papal bulls which forbade the inquisitors to tamper with the secular power under pain of excommunication. Among other proofs of this assumed irresponsibility, one of the strongest is the famous trial of Carranza, archbishop of Toledo, in the reign of Philip II., who had attended Charles V. at St. Yusto in his last moments, and whom neither the briefs of the pope Pius IV. nor the remonstrances of the prelates assembled at the council of Trent could save from being confined in the prisons of the Spanish Inquisition for more than seven years, without a termination of his trial; and when at last pope Pius V. demanded of the Spanish inquisitor and of the king, under pain of excommunication, that the archbishop and the papers of his trial should be sent to Rome, all sorts of obstacles were thrown in the way of his departure and his final acquittal by the pope. After the death of Pius V. new proceedings were commenced in Spain to prove the archbishop guilty of heresy, and on the information being transmitted to Rome, Gregory XIII., who had succeeded Pius V., was, though with evident reluctance, induced to declare, on the 14th April, 1576, that the archbishop of Toledo was strongly suspected of believing sixteen

propositions qualified as Lutheran, and which had been deduced from the context of his writings by the casuists of the Inquisition. He was then sentenced to five years' confinement in a Dominican convent and other canonical penances. A few days after this sentence, the archbishop, who was then seventy-two years of age, was taken dangerously ill, and before receiving the sacrament, on the 30th April, he solemnly declared in presence of several witnesses 'that he had never fallen into the errors with which he had been charged; that his expressions had been distorted into a meaning totally different from his; that he however humbly submitted to the judgment pronounced by the sovereign pontiff, and heartily forgive all those who had taken part against him in the trial, and would pray for them before the throne of Grace.' On the 2nd of the following May the archbishop died in the convent of La Minerva at Rome, in which he was detained, and where he was buried. An inscription was placed over his tomb by order of Gregory XIII., in which he was described as a prelate 'illustrious for his birth, his life, his doctrine, his preaching, and his charity.' Llorente gives a copious abstract of this celebrated trial in chapters 32, 33, and 34 of his *History of the Inquisition*.

Pope Paul III., alarmed at the progress of the doctrines of the Reformation, with the consent of Charles V. sent inquisitorial commissioners to the various states and provinces of Italy to try heretics; but they were instructed to proceed according to the usual form of the ecclesiastical courts, the depositions and names of the witnesses were to be communicated to the accused, and sentence of condemnation was not accompanied by confiscation; in short their powers were very different from those of the Spanish Inquisition. The Spanish viceroy of Naples, Don Pedro de Toledo, applied to the pope for an inquisitorial commissioner with a brief to proceed against persons suspected of heresy, but the Neapolitans, who were acquainted with the severities of the Spanish Inquisition, revolted, and, after much bloodshed, Charles V. promised that no Inquisition should be established in the kingdom of Naples, and that cases of heresy should be tried, as before, by the ordinary episcopal courts. These occurrences took place in 1546-7, and the Neapolitans, the better to secure themselves against the dreaded tribunal, established a court whose office it was to watch against any attempt to introduce the same under any shape—a kind of inquisition against the Inquisition. This court, which continued to exist till the French invasion of 1799, was styled 'Tribunale contro quello del Sant Uffizio,' and was composed of deputies, chiefly noblemen chosen by the different Seggi into which the Neapolitan nobility was classed. To the Neapolitan character, mercurial and communicative, the secret and mysterious proceedings of the Inquisition were peculiarly obnoxious.

Philip II. wished to introduce the Spanish Inquisition into the duchy of Milan, but the towns of Lombardy sent deputies to the council of Trent to remonstrate against it, and the Milanese and other Italian bishops wrote to the pope and to Cardinal Borromeo, representing that the Inquisition of Spain acted in the dark, in an arbitrary manner, and with strange and fearful forms of proceeding, that it took away the jurisdiction from the bishops, that it showed itself more a rival than a subject to the papal see, that it had repeatedly refused to send a copy of its trials to Rome, and that if it were introduced into Italy, the Italian prelates, having its terrors before their eyes, would become estranged from the holy see. The pope, being easily persuaded by these reasons, interposed with King Philip, saying that if required he would, after consulting with the bishops of Lombardy, himself send inquisitorial commissioners from Rome, who should proceed not according to the Spanish form, but according to the canon law, and without prejudice to the episcopal authority. Thus the Spanish Inquisition was not introduced into Milan or into any other Italian state, with the exception of Sicily, which was an old dependency of the crown of Aragon.

The court of the Inquisition, as it was established in the sixteenth century, in Tuscany, Venice, Milan, Parma, and other Italian states, consisted of one inquisitor, sent from Rome, with assessors approved by the sovereign of the respective states, who appointed deputies or commissioners to attend the trials and report to him. The sentences of the court were subject to the sanction of the temporal sovereign.

The republic of Venice showed itself the most jealous of its sovereign rights in this particular. A series of statutes were issued at various times by the senate to regulate the proceedings of the inquisitors, which are given by Paolo Sarpi, in his 'History of the Venetian Inquisition,' and by Limborch, b. i., ch. 17. By a concordat with Pope Julius III., A.D. 1551, it was decreed that three senators were to attend all the proceedings and judgments of the Inquisition in the city of Venice, and although they took no part in the trial, they had the right to suspend the execution of the sentence and report to the senate. In the provincial towns lay magistrates were appointed to perform the same duty in the respective courts of the Inquisition. The Inquisition could not molest Jews or other unbelievers, or Greeks living under the protection of the republic. It could not take cognizance of cases of blasphemy or polygamy—which belonged to the secular jurisdiction—nor of witchcraft, nor of minor infractions of discipline, such as eating or selling of meat on Fridays, &c. Numerous other checks are provided by the same statutes. In short, although the Venetian senate was obliged by prudential reasons to admit the Inquisition within its territories, it took care to render it as inoffensive as possible. The famous tribunal of the state Inquisition, which was entirely a political institution of the Venetian aristocracy, and must not be confounded with the ecclesiastical Inquisition, is described under VENICE.

In Tuscany the grand-dukes Medici had provided that deputies appointed by themselves should attend the trials of the inquisitorial court, and should report to them, and that no sentence should be executed without their sanction. But in the year 1566, pope Pius V., a zealous promoter of the Inquisition, demanded of the grand-duke Cosmo I. the person of Pietro Carnesecchi, a man of some rank and learning, and well affected to his sovereign, but who had publicly adopted several tenets of the Protestant Reformers. Cosmo gave him up to the officers of Rome, but at the same time wrote earnestly to the pope to save him. Pius was inclined to spare his life, if Carnesecchi had shown signs of repentance, but he boldly persisted in his opinions, and in August, 1567, he was convicted by the Roman Inquisition of thirty-four heretical tenets, and condemned to death. The grand-duke again wrote in his behalf, and the pope suspended the execution for ten days, promising to spare his life on condition that Carnesecchi should abjure his tenets, and he sent him a friar to exhort him to do so. But Carnesecchi remained firm: he argued with the monk and wanted to gain him over to his own opinions. He was publicly beheaded at Rome, and afterwards burnt. In the following century Galileo was summoned from Florence to Rome, where however he was treated with considerable lenity, and after a verbal abjuration and a few months' confinement, he was allowed to return to Florence. The executions in Tuscany in consequence of sentences of the Inquisition have been comparatively few. The tribunal continued to exist in Tuscany till the reign of Leopold of Austria, who began by curtailing its jurisdiction, took away its 'sbirri,' or bailiffs, gave the censorship of books to a lay magistrate, and at last abolished the tribunal altogether in 1787. About the same time it was suppressed at Milan by the emperor Joseph II. In 1769 the duke of Parma abolished it in his territories.

Pope Paul III. founded at Rome, by a bull dated April, 1643, the Congregation of the Holy Office, consisting of six cardinals, who were styled 'inquisitors-general of the faith,' who had the superintendance over all other inquisitors, and he gave them full authority to proceed, without the concurrence of the ordinaries or bishops, against all heretics or persons suspected of heresy, to punish them, confiscate their property, to degrade and deliver to the secular courts all clerical offenders, to call in if required the assistance of the secular arm, to appoint inquisitors with such powers as they thought proper, to appoint fiscal attorneys, notaries, and other officials, and to hear and decide on appeals from the judgment of other inquisitors. The pope however declared that by this bull he did not intend to make any alteration in the privileges of the Spanish Inquisition as then established.

In 1564 popes Pius IV. and V. confirmed and extended the powers of the Roman Inquisition, which however were resisted in the kingdom of France. In that kingdom there was no regular tribunal of the Inquisition. The Cardinal de Lorraine, under Henri II., had indeed appointed delegated inquisitors who acted as extraordinary judges in the trials of

the Huguenots, but their jurisdiction was not exclusive, as the parliament also took cognizance of the crime of heresy, besides which the king appointed special commissioners for the same purpose. (*Histoire du Parlement de Paris*, ch. 21.) But the authority of the Inquisition was totally abolished in France as soon as tolerance was established by the Edit de Nantes under Henri IV., which allowed the Protestants the exercise of their religion, for tolerance and the Inquisition could not possibly exist together; and although Louis XIV. afterwards revoked that edict and persecuted the Protestants, he did it by means of the secular power, and took care not to allow the introduction into his kingdom of an ecclesiastical tribunal which would encroach upon his own sovereign authority. But he advised his grandson Philip V., whom he placed on the throne of Spain, to maintain the Inquisition as a means of ensuring the tranquillity of that kingdom.

Sixtus V., in 1588, having distributed the cardinals into fifteen congregations or boards, made that which was styled 'Holy Roman and Universal Inquisition' to consist of twelve cardinals with several prelates as assessors, including the Master of the sacred palace, several monks with the title of 'consultors,' besides other clergymen and lawyers called 'qualificators,' whose business it was to prepare the cases. This is the Inquisition which still subsists at Rome, but its jurisdiction does not extend beyond the limits of the Papal State, and it is generally understood that its powers are exercised with considerable leniency and caution. Pius VII., after his restoration, is said to have abolished the use of the torture.

The Roman Inquisition watches more particularly over the conduct of the clergy, and has also the censorship of the press and of the introduction of foreign works. Provincial inquisitors reside at Bologna, Ferrara, and other towns of the Papal State, which is now the only country in which the tribunal of the Holy Office still remains.

In Germany and in Poland, the Inquisition has long since ceased to exist. In Spain it was suppressed, first by a decree of Napoleon, dated Chamartin, 4 December, 1808, as encroaching upon the rights of the sovereign, 'attentoire à la souveraineté.' This decree however was only enforced in those parts of the monarchy which were occupied by the French.

On the 12th February, 1813, the extraordinary Cortes of Spain assembled at Cadiz definitively suppressed the Inquisition, as being incompatible with the new political constitution of the monarchy. At the same time they restored to the bishops the exercise of the ecclesiastical jurisdiction in cases of heresy. An interesting abstract of the long debate which took place upon this important question is given by Agustin de Arguelles, in chapters x. and xi. of his 'Examen Historico de la Reforma Constitucional,' 8vo., London, 1835.

Ferdinand VII., after his restoration, re-established the Inquisition by an ordinance of the 21st July, 1814, and appointed the bishop of Almeria inquisitor-general. In this act Ferdinand stated to the people that one of his objects in re-establishing the Inquisition was 'to repress the mischief occasioned to the national faith by the presence of the foreign troops which were not Catholic,' including of course his allies the English, who had been the chief means of restoring him to the throne. The new inquisitor-general published an edict, on the 5th of May, 1815, in which, after deploring the progress of infidelity and the corruption of morals, he proposes to employ against these evils not the fiery zeal of those apostles who would have called down the fire of heaven upon Samaria, but the milder spirit of their Divine Master, and he exhorts all offenders against the laws of the Holy Office to come and acknowledge their errors before the end of the year, in order to receive private absolution without any public penance.

The Inquisition continued in Spain till the Revolution of 1820, when it was again suppressed by the Cortes. During these five years of its re-establishment, many persons were arrested, but none appear to have been put to death in consequence of its judgments. When Ferdinand, in 1823, a second time overthrew the constitution, he did not re-establish the Inquisition. In Portugal, the Inquisition, which was likewise abolished by the Cortes, has not been restored.

Various and often exaggerated accounts have been published of the number of persons put to death by the Spanish Inquisition during the three centuries of its existence. Llorente, who wrote with calmness and had access to the archives of the tribunal, gives an approximate estimate of the number executed under each inquisitor-general, from which it results that the total amount in Spain is about 32,000 persons burnt, either alive or after being strangled, 17,000 burnt in effigy, and 291,000 condemned to various terms of imprisonment, to the galleys, or subjected to other penalties. During the eighteen years of Torquemada's inquisitorship alone, about 8800 persons were burnt. This calculation does not include the Spanish colonies, nor the islands of Sicily and Sardinia, which were long subject to the Spanish Inquisition. It is impossible to ascertain the amount of the victims of the Inquisition in these as well as in other countries of Europe. The last person burnt by the sentence of the Inquisition in Spain was a woman accused of having formed a contract with the devil. She was burnt at Seville, on the 7th November, 1781. The three last inquisitors-general, from 1793 to 1808, did not sentence any one to death.

In examining the history of the Inquisition under its various forms, two things ought to be carefully distinguished; the principle and the practice of that remarkable institution. The fundamental principle of the Inquisition is, that heresy, that is to say, dissent from the tenets of the Roman church, is a heinous crime, and liable to both spiritual and temporal punishment. This principle however is not peculiar to the Inquisition: it is that of the canon law, and it has the countenance of the Roman law in several constitutions of the early Christian emperors. In every country therefore in which the canon law has civil or temporal force, the principle subsists, although it may lie dormant. A subject of such a country who should openly dissent from the established Church is liable to prosecution by the episcopal or the secular courts. This is still the case in several states of Italy, and even in Spain and Portugal under their new constitutional governments, at least until a new code shall be enacted. It must not be forgotten that the Inquisition was established in Spain while the Cortes of Aragon and Castile were still in full vigour. It is not long since the minister of justice stated in the Spanish Cortes that laws were still in force by which persons, dying in a state of heresy, cannot bequeath their property. It is not therefore sufficient for the Inquisition to be abolished in a country, in order to ensure liberty of conscience; it is not even sufficient for this purpose to establish a representative or republican government, as long as the canon law remains in force and the majority of the people do not tolerate dissent. In the small democracies of the forest cantons of Switzerland, which are exclusively Roman Catholic, no dissent from the church is allowed, and persons accused of heresy are severely punished or obliged to emigrate.

In speaking of religious liberty, people are apt to confound three things very distinct, such as toleration, liberty of conscience or of opinion, and full religious liberty. Toleration properly applies to foreigners who profess a different faith from that established in the country which they come to visit or inhabit for a time, and who are tolerated, that is to say, allowed to remain unmolested, and in some cases are permitted to have chapels of their own communion. This is now the case in almost every European country, at least with regard to particular Christian communions and to the Jews. The Lutherans and Calvinists have chapels in almost every Catholic state, and even at Rome and Naples. But this toleration is not a legal right; it is only granted during pleasure to certain nations and sects, and it applies only to foreigners and by no means to natives. Even during the rule of the Inquisition in Spain, English, Dutch, and other Protestant merchants were allowed to reside in the seaport towns, but only so long as they gave no scandal or offence to the Catholic faith, and their position was therefore extremely delicate and insecure.

Liberty of conscience applies to natives as well as foreigners, and in the country where it is recognised, no one can be molested for his religious opinions or private religious practice. But the law regulates whether and under what conditions chapels or places of religious worship may be opened which dissent from the established church of the country. Much is left to the discretionary power of the executive. Thus in France, wherever there are in a town a certain number of Lutherans or Calvinists, they are allowed to have a place of religious worship, subject to certain regulations of the local authorities. In the Austrian states, by the

edict of the emperor Joseph of 1784, wherever there are 100 families of Protestants in one place, they may ask of the authorities permission to open a place of worship. Liberty of conscience is only found in countries where a considerable part of the population dissent from the established church; it does not exist in the Italian states or in other countries exclusively Roman Catholic. All the Protestant states of Europe allow liberty of conscience.

Full religious liberty is said to exist when not only every man may hold what opinions he pleases, but when every Christian sect may openly profess its faith and perform publicly its rites; and this not by especial permission, but as a matter of legal right. This is the case at present only in England and its colonies, and in the United States of North America. But even those countries cannot be said to have unlimited religious liberty, for this would mean that any one might set up any form of worship that he pleased. Now it cannot be believed that Fetish or other pagan rites would be publicly allowed in England or America. Therefore the religious liberty of England and America can only be said to extend to the various Christian and Jewish communions. And indeed it is questionable whether religious liberty in its full unlimited extent could exist in any orderly community of which the majority believe in any religion whatever; for what would be called liberty by some, would appear offence and scandal to the rest. Besides which the danger of proselytism must necessarily complicate the question still more. Mohammedans tolerate Christians and Jews, but will not allow any one to apostatise from the Koran. In the great French revolution, even those who professed to disbelieve all revealed religion, and who advocated full religious freedom, when they came to have the power in their hands, would not allow the people to worship God according to the old custom, but shut up the churches, persecuted the priests, and denounced religious meetings as treasonable. They would allow no dissent from incredulity. So much are men of all ways of thinking disposed to intolerance towards those who differ from them, not only in religious matters, but also in matters political, social, and even literary or scientific.

In the case however of countries in which penal statutes exist against heretics, it is still an important question how and when and by whom those statutes are to be enforced. We have seen how the Inquisition did enforce them, and the general opinion of Europe, not merely of Protestant but of Roman Catholic Europe, has reprobated and rejected its practice. The secular power has now taken into its own hands criminal jurisdiction in all its branches in every European state, with the single exception already mentioned of the Papal State, where, the government being in the hands of ecclesiastics, the jurisdiction of the canon law is kept distinct from that of the civil law, and has its own courts, of which that of the Inquisition is the principal. The secular power, at present, even in countries exclusively Roman Catholic, does not encourage spies and informers to pry into men's religious sentiments: it does not, like the Inquisition, consider men guilty merely because they silently dissent from the rites of the established church; it observes the essential distinction between opinions and acts, and leaving the former to man's conscience, it takes cognizance of the latter only. In so doing it goes back to the principle of the Theodosian and Justinian codes, whose constitutions against heretics were directed against those who made an open practice of their heterodox opinions, who assembled meetings, preached or spread their doctrines by writing, attempted to make proselytes, and thus disturbed the unity of the church and the tranquillity of the state. They were punished, not so much as heretics, but as rebels against the law, and their open acts were evidence against them. It was only in the thirteenth century that the Inquisition set about discovering private and silent heretics, and having once established the principle that it was necessary to ferret out, as it were, all individuals who dissented in their minds from the orthodox church, all kind of means were thought lawful for that purpose. Hence a system of secret and even anonymous denunciations was encouraged, domestic privacy was invaded, acts innocent in themselves were construed into guilt, and ample opportunities were given to private malice and revenge, as the informers were safe from the risk of discovery. The bad character of an informer or his relative position towards the accused was no objection to his denunciation being received, whilst, by a striking contrast, the Inquisition would closely scrutinise the character of the witnesses whom the accused called in his defence. Confessors were bound to exact of their penitents, under pain of non-absolution, that they should go and denounce to the Holy Office any person of whom they knew or had heard any thing which appeared contrary to the Roman Catholic faith. The witnesses summoned by the Inquisition for the prosecution were not informed of the subject on which they were called upon to give evidence, but they were asked at first whether they had seen or heard anything of any one which appeared obnoxious to the faith and to the rights of the Holy Office. At the preliminary examination of the prisoner, he was not made acquainted with the charges against him, but was told generally that there were good grounds of accusation against him, which he was left to guess, and that if he confessed all, he should be treated with mercy. Afterwards even the act of accusation of the fiscal attorney was not communicated to him in writing, but the particular charges were read to him in the hall of audience, and he was interrogated on each head, whether it was the truth. When the accused was called upon for his defence, he was obliged to choose for his counsel one among the list of the Inquisition lawyers, who was not permitted to communicate with him in private, and who did not know the whole of the proceedings nor the names of the witnesses. The limits of this article do not allow us to proceed further in exhibiting the other peculiarities of this strange system of proceedings, but the reader will find a full account of them in Llorente's chap. ix., on the proceedings of the Spanish Inquisition, and in Limborch's b. iv., on the mode of proceeding of the Inquisition in general. It was the horror of this terrific code which made nations revolt against this tribunal, which excited the war in the Netherlands that lasted nearly half a century and ended in the separation of one half of the country from the crown of Spain, which caused rebellions in Aragon, Sicily, Sardinia, and Naples, and embittered the religious feuds and wars of the sixteenth and seventeenth centuries. And yet with all the ingenuity displayed for the discovery and conviction of heretics, it is averred that a great number of individuals put to death by the Inquisition were orthodox Catholics. Among other proofs of this are the letters of Pietro Martire d'Angleria, councillor of the Indies, quoted by Llorente, ch. x., the trials of Carranza and many other bishops, and even of persons who have been since canonized by the Roman church, such as St. Francis de Borja, St. Ignatius Loyola, St Thérésa, St. Juan de la Cruz, &c. Even popes have not escaped the attacks of the Inquisition. Sixtus V. having published an Italian translation of the Bible, the Spanish Inquisition placed it upon its index of forbidden books. The same Inquisition condemned the works of Cardinal Noris, a friend of Benedict XIV., who wrote in a strong manner to the inquisitor-general on the subject. These and other disputes of the Spanish Inquisition with Pius V., Clement VIII., and other popes, amply prove the little deference which it paid to the papal authority whenever it came in opposition to its own assumed supremacy.

It is an error to suppose that intolerance is peculiar to the Roman Catholic church; all churches and religions, Jews, Mohammedans, and heathens, Arians and orthodox, Greeks and Latins, Protestants and Catholics—all have persecuted in turn; but no other church or sect ever invented or enforced for centuries a permanent system of persecution that can be in any respect compared with that of the Inquisition.

OFFSETS are lines drawn perpendicular to the chord of an arc, or the longest base of an irregular polygon, from points in the arc, or corners of the polygon. By means of these offsets the area contained between the chord and arc can be found with sufficient nearness. We mention this well-known term of surveying to direct attention to the article QUADRATURES, METHOD OF, which contains the set of successive approximations of which the surveyor's process is the first and rudest step.

OGLETHORPE, GENERAL. [GEORGIA.]

O'GYGES, or **OGYGUS** (Ὤγυγης, Ὤγυγος), is said to have been the first king of Athens and of Thebes. (Tzetz, *Lycoph.*, 1206.) Thus Pausanias tells us that the Ectenes, who were the most antient inhabitants of Bœotia, were the subjects of Ogyges, and that Thebes itself was called Ogygian, an epithet which is also applied to it by Æschylus. (Paus., ix. 5, § 1; Æsch., *Pers.*, 37.) That Ogyges was closely connected with Thebes as well as Attica appears from the tradition, according to which he was said to be the son of Bœotus. (Schol. on Apollon., iii. 1178.) It may also

be mentioned that the oldest gate in Thebes was called Ogygian. (Paus., ix. 8, 3.)

The name of Ogyges is connected with the antient deluge which preceded that of Deucalion, and he is said to have been the only person saved when the whole of Greece was covered with water. We possess scarcely any particulars respecting him; and the accounts which have come down to us are too vague and unsatisfactory to allows us to form any satisfactory opinion on the subject. He clearly belongs to mythology rather than to history. The earlier Greek writers, Herodotus, Thucydides, Xenophon, &c., make no mention of his name; but the accounts preserved by Pausanias and other writers appear to indicate the great antiquity of the traditions respecting him. Various etymologies have been proposed of his name. Mr. Kenrick supposes that the word was derived from the root γυγη, signifying darkness or night, and quotes a passage of Hesychius in support of his view, which appears however to be corrupt. The more favourite theory of modern scholars connects the name with Oceanus; which etymology is supposed to be supported by the tradition which places Ogyges in the time of the deluge. In support of this view it is remarked that Ogyges is only a reduplication of the radical syllable *Og* or *Oc*, which we find in Oceanus, and in Ogen (which is explained by Hesychius as equivalent to Oceanus, 'Ωγήν, 'Ωκεανός); and that a similar reduplication takes place in ἔτυμος, ἐτήτυμος· ὅπτομας, ὀπιπτεύω, ἄταλος, ἀτιτάλλω. But these are mere guesses. The name of Ogygia is supposed to be applied to the island of Calypso because it lay in the ocean. But whatever may be the etymology of the name, the adjective derived from it is frequently employed by the Greek writers to indicate any thing antient or unknown. We learn from the Scholiast on Hesiod, that according to one tradition Ogyges was the king of the gods; and it is not improbable that the name originally indicated nothing more than the high antiquity of the times to which it referred.

(*Philological Museum*, No. 5, 'On the early Kings of Attica,' by Mr. Kenrick; No. 6, 'Ogyges,' by Mr. Thirlwall.)

OHIO, River. [MISSISSIPPI, River.]

OHIO, one of the states of the North American Union, lies between 38° 30′ and 42° N. lat. and 80° 30′ and 84° 50′ W. long. It extends from east to west 220 miles in length, and its breadth from north to south varies between 93 and 200 miles; its average breadth may be 182 miles. On the west it is divided from the state of Indiana by a meridian line running south to the Ohio river, and measuring 170 miles. On the north lies the state of Michigan, from which it is separated by a straight line 80 miles long. Lake Erie, which borders it on the north and north-east, forms a coast-line of more than 150 miles. A meridian line running from the Ohio to Lake Erie, and dividing Ohio from Pennsylvania, is 93 miles long. The southern and south-eastern boundary is formed by the river Ohio, whose tortuous course along this line is stated to be 500 miles. Ohio comprehends nearly 40,000 square miles, or not much less than the kingdom of Portugal.

Surface and Soil.—The surface of this state may be divided into the Hilly and Prairie Region. The Hilly Region comprehends the eastern and southern districts, and may be considered as separated from the Prairie Region by a line commencing at the most north-eastern point of the state on Lake Erie, and running in a south-south-western direction to Zanesville on the river Muskingum; from this place it extends due west, and terminates on the boundary-line of Indiana near Eaton. Each region occupies about half the area of the state.

The *Hilly Region* contains some level and low land along the Ohio, but the level land does not extend more than one mile and a half from the bank of the river. It is very fertile, though in some parts swampy and subject to inundations. Behind this level tract the country rises suddenly into steep hills, called River Mountains, which vary in height, but in general range between 300 and 500 feet above the level of the river. From the summit of these hills the country extends in an uneven hilly plain furrowed by valleys; the hills are comparatively small, though very steep. Their summits form level plains of moderate extent. Rocks rarely appear on the surface, at least not to any great extent, though secondary limestone and sandstone prevail at a moderate depth below the surface. There are no precipices except along the numerous watercourses. The general elevation of these uplands varies from 800 to 1000 feet above the sea-level. The inequalities of the surface do not render it unfit for cultivation. The bottoms along the principal rivers, which are frequently extensive, are exceedingly fertile, and produce very rich crops of grain. The declivities of the hills, when not too steep for cultivation, and the higher grounds between them, are less fertile, but by no means barren. The soil of both the bottoms and hills is almost uniformly an argillaceous loam; the soil of the valleys is very deep, and contains much lime and vegetable mould; the soil of the uplands is not so deep, though more so than is usually found in hilly regions. As the soil is light and unencumbered with stones, it is cultivated with ease. In its natural state the whole region is covered with trees. The uplands contain different kinds of oak, hickory, walnut, ash, poplar, dogwood, mulberry, sassafras, and some yellow pine. The levels along the Ohio and the other rivers are overgrown with button-wood, white pine, hemlock, butternut, the tulip-tree, locust, honey-locust, black alder, beech, elm, cedar, and cypress. The maple-tree is common all over the state.

The *Prairie Region* is an extensive and tolerably level plain. It contains no hills of any considerable magnitude, except numerous swells, some of which are extensive. Other parts contain large tracts of flat country, where scarcely an undulation of the surface can be discovered. The general elevation of this region hardly exceeds 1000 feet. This plain contains the watershed between the rivers which run southward to the Ohio and northward to Lake Erie.* Near the north-eastern extremity of the state the watershed approaches the shore of Lake Erie within less than ten miles, but as it proceeds westward it retires about 20 or 25 miles from the lake, and continues at that distance, and nearly parallel to the southern shore of the lake, to 83° W. long., where it turns to the south of west and divides the upper branches of the Maumee and Miami rivers. No hills are visible along this line, and in many places the country is swampy. According to an exact survey, made for the purpose of constructing canals, the source of the Big Beaver River is 907 feet, that of the Muskingum 902, that of the Scioto 919, and that of the Miami 964 feet above the sea-level. These numbers show how small a difference in elevation exists along a line exceeding 200 miles in length. It is also remarkable that the elevation increases as we advance west from the Muskingum to the Miami river. But west of the last-mentioned river, where the watershed begins to run in a north-western direction, it declines again towards Lake Michigan. In the vicinity of this lake, the elevation of the watershed is only 700 feet, or about 130 feet above the surface of the lake. The tract in which these rivers originate is less elevated than the country which is south of it and extends to the banks of the Ohio river. The surface of this plain presents an alternate succession of woodlands and prairies. In the eastern districts the woodlands prevail. Near 83° W. long., or in the middle of the state, the surface is nearly equally divided between woodlands and prairies; but farther west the woodlands decrease in extent. The prairies are both wet and dry, but are all fit for cultivation. Along the south-western shores of Lake Erie there is an extensive tract covered with a deep swamp, called Black Swamp. A great part of the marshy and wet country is heavily wooded, especially with beech. The valleys by which this table-land is intersected, and in which the rivers flow, are less depressed below the surface of the plain than farther south, but they are broader and more regularly defined, being separated from the adjacent uplands by parallel ranges of bluffs, or mural banks. They are generally very fertile. Besides beech, which is most common on the swampy tracts, the forests of this region contain oak, ash, elm, hickory, sugar-maple, wild cherry, black walnut, poplar, and in some places cotton-wood and sycamore, most of which, especially the sycamore, attain a gigantic size.

Rivers.—The Ohio river runs along the eastern and southern boundary-line of Ohio. [MISSISSIPPI.] The other rivers which drain this country, though comparatively small, have recently acquired great importance, as affording the means of establishing a very extensive water communication in the interior of the state and between the countries bordering on Lake Erie and on both sides of the Ohio river. The most important of the rivers which fall into Lake Erie are the Maumee, the Sandusky, and the Cayahoga. The Maumee is formed by two branches, the St. Mary's and the

St. Joseph's rivers, of which the former rises in Ohio, and runs north-west, and the latter originates in the state of Michigan, and flows south-west. St. Mary's River is navigable from St. Mary's Fort downward during half the year for large boats carrying from 100 to 200 barrels of flour; during the rest of the year, in the dry season, there is scarcely water enough to float a canoe, and the course is much impeded by drift-wood. St. Joseph's River is stated to be navigable for 50 miles for boats. Both rivers unite after a course of about 70 or 80 miles at Fort Wayne, at a very acute angle, and then run east by north to Lake Erie, under the name of the Maumee. The Maumee runs about 160 miles, and during the spring has a free navigation for boats carrying 300 barrels of flour along the whole of its course. In the dry season the navigation is impeded by sand-bars. It empties itself into the western corner of Lake Erie by a wide mouth called Maumee Bay. The Sandusky river originates near 83° W. long. and 40° 45′ N. lat., in two branches, which flow westward, and after their union turn northward. Towards its mouth it declines to the north-east, and falls into Sandusky Bay, a shallow sheet of water united to Lake Erie by a narrow strait. This river runs more than 100 miles, and is navigable for small boats during the early part of the year. The Cayahoga is the most important of the rivers which fall into Lake Erie, though its course does not exceed 80 miles. It rises west of 81° W. long., and in 41° 35′ N. lat., about 10 miles from the shores of Lake Erie. It flows first in a western and south-western direction to 41° 8′ N. lat., where it takes a north-north-western course to Lake Erie. In its natural state it was not navigable, but the waters are used to feed the Erie and Ohio canal.

The most important rivers which fall into the Ohio are the Big Beaver, Muskingum, Scioto, and Miami rivers. The Big Beaver rises east of the upper course of the Cayahoga river, and runs in an eastern and south-eastern direction for more than two-thirds of its course. In these parts it is not navigable on account of its great rapidity. After entering Pennsylvania, it receives from the north, near Newcastle, the Shenango river, and from this place downwards, a distance of 24 miles, is navigable for river barges. The Muskingum rises near 41° N. lat., south of the southern bend of the Cayahoga river, in two branches, of which the eastern is called Tuskawara and the western Chippewa Creek. By their union they form the Muskingum, which flows about 70 miles south, then nearly the same distance west, and lastly about 70 miles south-south-east. This river has much water, and is navigable for boats all the year for about 140 miles upward; when the waters are high, small vessels may ascend the Tuskawara Creek nearly to its source. Its waters are increased by many considerable affluents: at its mouth it is 541 feet above the sea-level. The Scioto river rises near 40° 30′ N. lat., and flowing southward nearly through the middle of the state, falls into the Ohio after a course of about 250 miles. At its mouth it is 464 feet above the sea-level. It is navigable for large boats nearly 200 miles upward. The Miami originates not far from the source of the Scioto river, and runs in a general southern direction about 165 miles. It becomes navigable a few miles above Piqua for keel-boats, during half the year. At Piqua there is a considerable rapid, and a canal is cut to avoid it in ascending the river. In the dry season it ceases to be navigable at Dayton, about 80 miles from its mouth. The navigation is always rendered difficult by numerous sand-bars. At its mouth it is about 400 feet above the sea-level.

Canals.—The moderate elevation of the country between Lake Erie and the Ohio river, and its gentle slope towards both basins, suggested the idea of uniting them by a canal. It was found that the Ohio at the mouth of the Muskingum river was only 24 feet lower than the surface of Lake Erie, and the highest part of the intervening country, near the source of the Muskingum river, was only 337 feet above Lake Erie. A canal was accordingly made, which united the Muskingum and Scioto rivers. This canal, which was begun in 1825 and finished in 1832, and is called the Erie and Ohio Canal, is 324 miles in length, has 44 locks, and begins at Cleveland, where the Cayahoga falls into Lake Erie. It runs southwards along the Cayahoga river to its most southern bend, where it passes to the Tuskawara Creek over the highest level. It then follows the course of the Muskingum first south and then westward. Where this river bends again to the south, the canal continues westward and reaches the Scioto river, about 10 miles south of Columbus: from this point it runs along the course of the last-mentioned river to its mouth near Portsmouth. It passes the towns or villages of Newark, Coshocton, Circleville, Chillicothe, and Piketon. There are several short branches from the main canal, one of which runs to Columbus, the capital, and is eleven miles long. Another canal has been made to remedy the difficult navigation of the Miami. It is 65 miles long, beginning at Dayton on the Miami, and extending along the course of the Miami to Hamilton, whence it runs southward to Cincinnati on the Ohio. A canal was begun some years ago which is to unite the Wabash river of Indiana with the Maumee. It is to be 211 miles long, of which 136 are in Indiana and 75 in Ohio. We do not know how far this work has advanced.

Climate.—In comparing the climate of Ohio with that of England, it appears that the climate of Ohio is colder in winter and warmer in summer. The mean annual temperature at Cincinnati on the Ohio, which is sheltered on the north by high hills, was found, after many years of careful observations, to be 53·56°, or about 3·86° higher than that of London. The mean temperature of the winter at Cincinnati is 36°, at London 39·3°; that of the spring at Cincinnati 63°, and at London 54·1°; that of the summer at Cincinnati 72°, and at London 61·2°; that of the autumn at Cincinnati 43°, and at London 44°. This shows, that the winters are somewhat colder in Cincinnati than in London. The cold is considered very great if the ground which is exposed to the sun's rays remains frozen during a month, though the mean temperature of January is more than two degrees below the freezing-point. The frost does not penetrate to the depth of more than five or six inches. Night-frosts occur in the beginning of May. Vegetation does not begin before the first week of March. In May and in June the heat increases rapidly, and the difference of the mean temperature of the spring in London and Cincinnati amounts to 9°. For about fourteen days in summer the thermometer rises to 90° and sometimes even to 98°. The autumn is colder than in London, and the first night-frosts occur at the end of September or beginning of October. The greatest decrease of heat takes place in October. Most of the rivers, including the Ohio, are covered with ice every winter. On the 14th of February, 1817, this river near Marietta was frozen to the depth of 19 inches. In 1797 the mercury sunk to 14°. The quantity of snow is small. In the valley of the Ohio it seldom exceeds four inches, but in the northern districts the quantity is much greater. The south-west wind prevails for nine months in the year, from March to November included. In December, January, and February the wind generally blows from the north-west. The greatest quantity of rain falls in April and May; the mean annual quantity is stated to be 36 inches.

Productions.—The wealth of Ohio consist in its agricultural productions: Indian corn, wheat, rye, oats, barley, and tobacco are extensively cultivated. Cotton arrives at maturity only in the districts along the Ohio river; and is liable to be injured by frost. Indigo was formerly cultivated to some extent, but the cultivation has been nearly abandoned. Most of the fruit-trees of England succeed well, and especially peaches. The wild grape grows luxuriantly on the southern side of the hills; and several vineyards have been planted, from which pretty good wine is obtained. The cultivation of the grasses is not neglected. Horned cattle and pigs are very abundant, and are driven in great numbers to the Atlantic states for sale, or sent down the Mississippi. Salt pork also constitutes an important article of exportation.

Bears and deer are still numerous in the forests, and the flesh of both is dried and cured for sale. The woods abound with wild turkeys, geese, ducks, pheasants, and partridges. The rivers, especially the Ohio, are well stocked with fish, and some of them attain a great size. Turtles are also found in them, and one kind is considered a great delicacy.

Iron-ore abounds, and is worked in a few places not far from the Ohio river. Bituminous coal exists in extensive strata along the Ohio and some of its confluents, but it is not yet extensively worked. Salt is obtained from springs on the Scioto river, and saltpetre and alum are found in several places.

Inhabitants.—The Indians, who in 1816 amounted to more than 3000 individuals, have lately abandoned the country, and settled chiefly to the west of the Mississipp' river. The Wyandots still remain in Crawford county.

on the upper course of the Sandusky river, between Columbus and Lake Erie. This tribe consists of less than 500 individuals; they cultivate some grain and keep cattle. The population, exclusive of the Indians, amounted, according to the census of 1830, to 937,903 individuals, of whom little more than 9000 were free coloured people, and the others were whites or descendants of Europeans. The great mass of the people is from the New England states. As no state in the Union has lately increased more rapidly in population, it is probable that by the census to be taken in this year (1840) it will not fall much short of 1,500,000 individuals. The population is not equally distributed over the surface of the country. The valley of the Ohio is not so populous as might be expected. Large tracts of it are but thinly settled, especially that which extends from the mouth of the Muskingum to that of the Scioto. The best settled districts are those of the hilly region which extends along the large rivers. The eastern districts of the prairie region, where the wooded tracts exceed the woodless plains, are nearly as populous. But nearly one-fourth of the state, or its north-western portion, is still thinly settled.

Political Division and Towns.—Ohio is divided into 75 counties. Columbus, the seat of government, is on the left bank of the Scioto river, very near the centre of the state; the population in 1835 was 4000; in 1812 the site of the town was covered with trees. It has little trade at present, and cannot rise to importance until the north-western portion of the state is better settled. The largest town is Cincinnati on the Ohio [CINCINNATI]; its population has not increased so rapidly since the opening of the Erie and Ohio Canal, because the produce of the eastern and better cultivated portion of the state goes now to Cleaveland, and thence to New York or Montreal. Cleaveland on Lake Erie, where the Erie and Ohio Canal begins, may be considered as the principal port of the state. The population in 1830 was 1076; in the beginning of 1835, one year and a half after the opening of the canal, it had increased to 4200 inhabitants, and it is now about 10,000. Steubenville, on the Ohio, contained about 3000 inhabitants in 1830, and has several manufacturing establishments. Zanesville, on the river Muskingum, a thriving place, had 3500 inhabitants in 1830, with some glass and vitriol manufactures and numerous flour-mills. Marietta, at the confluence of the Muskingum with the Ohio, is the oldest settlement of the state, being founded in 1788; it contained in 1830 about 1200 inhabitants. Portsmouth, at the mouth of the Scioto, and the termination of the Erie and Ohio Canal, is a thriving and populous place. Chillicothe, a well built town, in a very fertile tract on the river Scioto, has about 3000 inhabitants; Dayton, on the Miami, and at the beginning of the Miami Canal, has also about 3000 inhabitants. On the shores of Lake Erie is the small town of Huron, at the mouth of the river of the same name, which since 1833 has carried on some trade.

Manufactures.—Though this branch of industry cannot be expected to have made much progress in a country so lately settled, yet there are several manufactures of iron, wool, and cotton, although generally on a small scale. At Cincinnati and Cleaveland many vessels are annually built, especially steam-boats. The manufacture of salt is of importance. In 1830, 446,350 bushels were made, chiefly at and near Lancaster, south-east of Columbus.

Commerce.—Until the opening of the Erie and Ohio Canal, nearly all the commerce of Ohio was concentrated in the town of Cincinnati, which was the only place from which the produce of the state was exported, and by which foreign goods entered it. But since 1830 a large portion of the articles designed for the foreign market go to Cleaveland, and the supply of foreign goods comes through the same place. Its commerce has increased at an astonishing rate. In 1825 the number of vessels which entered the port was only 75, with a tonnage of 7310, and the value of the exports and imports was respectively 50,166 dollars and 132,645 dollars. In 1833 the total number of vessels, including steam-boats, was 1505, with 332,500 tons; the value of goods exported exceeded 2,000,000 dollars, and of goods imported 4,700,000 dollars. The distance of Cleaveland from the city of New York by the line of the canals, Lake Erie, and the Hudson river, does not much exceed 650 miles, and from Montreal in Lower Canada it is even less, whilst the distance of Cincinnati from New Orleans by land is 860 miles, and by water considerably exceeds 1000 miles. Besides this, the navigation on the Ohio and Mississippi is much more precarious and dangerous [MISSISSIPPI] than that on the canals, the Lake Erie, and the Hudson river, or on the St. Lawrence to Montreal. It is therefore probable that in a short time the greatest part of the produce of Ohio will find its way to Cleaveland and thence to New York or Montreal, and from these places the state will be supplied with foreign goods. Cincinnati however will always be the commercial depôt of the produce of the rich valley of the Miami river, and will continue a considerable place of trade. In 1833 its exports were valued at 5,000,000 dollars, of which pork amounted to 1,350,000. Some commerce is carried on with Baltimore, by way of Wheeling in Virginia, and with Philadelphia by way of Pittsburg, but it is not of great importance, on account of the heavy expense of the transport. The exports consist of live-stock, pork, bacon, beef, tallow, butter, whiskey, peach-brandy, ashes, soap, candles, some timber, and furs. The imports are manufactured goods from the United States and England, the produce of the West Indies, cotton, rice, and some articles of smaller importance.

Antiquities.—The remains of antient fortifications, which are found in many places west of the Appalachian Mountains, are most numerous and extensive in the state of Ohio. They generally consist of circular embankments, walls, and mounds many feet high; they occur principally in the western districts of the state. West of Chillicothe is a wall of stone from 12 to 15 feet high and 4 or 5 feet thick, which encloses upwards of 100 acres. The ruins of this kind near Piqua are of still greater extent, and others occur near Cincinnati, Hamilton on the Miami, and other places. They are overgrown with trees as large as those of the surrounding forests, and hence it is supposed that they must have been erected at a very remote period. The Indians who, until lately, were in possession of the countries in which they are situated, have no tradition respecting these fortifications, and hence it is conjectured that they were erected by a nation which has disappeared from the face of the earth.

Education has been much encouraged in Ohio. There are five colleges, the Ohio University at Athens [ATHENS], the Miami University, the Western Reserve College, Kenyon College, and Franklin College. There are a medical and a law school at Cincinnati. The New England system of common schools has been established. The chief religious sects are Presbyterians, Methodists, and Baptists.

History and Constitution.—This country was first visited by the French from Canada in the seventeenth century, by the route of the lakes Ontario and Erie, but no settlements were formed, until the British from Pennsylvania and Virginia began to occupy the country. The French tried to prevent this by establishing small forts from Presqu'ile on Lake Erie to the Ohio along the channel of the Alleghany river. This however was considered by the British government as an encroachment, and it led to the war of 1755, by which the French lost Canada and were expelled from North America. Some settlements which were attempted after that time were destroyed by the Indian tribes then in possession of the country. Ohio was comprehended in the cession made by Virginia in the year 1787, after which the country, including the states of Michigan, Indiana, and Illinois, was formed into a territory. The first permanent settlement was formed at Marietta about 1788, but its progress, as well as that of some others farther west, was slow, until the Indians, in 1795, ceded a great portion of the state to the general government by the treaty of Greville. The population now increased so rapidly, that in 1802 it attained the amount required for being constituted into a state. On the 29th November the present constitution was adopted, and in 1803 Ohio was admitted into the Union. The legislative body consists of a Senate and a House of Representatives, both elected by the white inhabitants who are twenty-one years of age and have resided in the state twelve months next preceding the election. The number of the House of Representatives is at present 72, and that of the senators 36: they are chosen annually. The number of the senators cannot be less than one-third nor more than one-half of that of the representatives. They are chosen biennially, and one-half of their seats are vacated every year. The supreme executive power is vested in a governor chosen for the term of two years by the same persons who elect the legislative body. Ohio sends two members to the Senate and 14 members to the House of Representatives at Washington.

(Darby's *View of the United States*; Pitkin's *Statistical View of the Commerce of the United States*; *American Almanac for* 1839.)

ÖHLMÜLLER, DANIEL JOSEPH, a German architect, who held the office of *Civilbau-inspector* at Munich, was born at Bamberg in 1791. After studying under Karl Fischer (died 1820), to whom many others were indebted for their professional education, he visited both Italy and Sicily, where he spent four years in examining the principal edifices, until he was summoned home in 1819, to superintend the erection of the Glyptotheca at Munich, after Klenze's designs. In 1831 he was commissioned to make designs in the Gothic style for a church in the Au suburb, and the first stone of the edifice was laid on the 28th November in that year. Taken altogether, this structure is one of the noblest and most successful works in that style which has been produced in modern times in Germany, and is remarkable for the splendour of its lofty windows, filled entirely with painted glass, one of which, whose subject is the Assumption of the Virgin, is represented in colours in Count Raczyneki's 'Art Moderne.' This building alone would suffice for Oehlmuller's fame; but it was not the only one in which he had an opportunity of displaying his talents during his brief professional career, for he erected in the same style both the national monument at Wittelsbach and the Otto chapel at Kiefersfelden, the latter of which was begun in 1834, and the other completed in 1835. The church of St. Theresia at Hallbergmoos, begun by him in October, 1833, is in the Italian style. On the death of Domenico Quaglio (1837), he was employed to complete the works at the castle of Hohenschwangau. He did not however long survive his predecessor in that building, for he died at Munich, April 22, 1839.

OIDE'MIA. [FULIGULINÆ, vol. xi., p. 7.]

OILS are substances obtained from very different sources and under various circumstances. First, animal fats [FAT], though more or less solid, are to be regarded, both on account of their general properties and chemical constitution, as varieties of oil; there are also animal oils more properly so called, as whale and spermaceti oil. Secondly, there are the oils of vegetable origin, as those of olives and linseed, obtained by pressure, and called fat, fixed, or expressed oils, and those procured by distillation, termed volatile, essential, or ætherial oils. Thirdly, there are various oils produced by heat from animal, mineral, and other bodies, such as Dippel's oil, and naphtha; and lastly, there are certain oils produced by chemical action, as oil of wine, &c.

As it is not possible here to describe every variety of each kind of oil, we shall select some of the more important and better known cases for illustration, and we shall commence with an account of some of the

Animal Oils.—One of the best known and most extensively used of these is common whale or train oil, obtained by melting the blubber of the animal. As met with in commerce, it is of a brownish colour, rather viscid, and has a disagreeable fishy smell and taste. Its specific gravity is about 0·927. When exposed to the temperature of 32°, it deposits stearin, and the oil separated from the stearin by filtration is soluble in 0·82 of pure alcohol when heated to about 168° Fahr. Like other oils, it does not combine with water; it does not redden litmus paper, and is therefore devoid of acid properties. Whale oil is very readily converted into soap, requiring for this purpose 0·6 of its weight of hydrate of potash and 5 parts of water. The resulting compound is known in commerce by the name of soft soap; it is of a brown colour, and perfectly soluble in water. When it has been decomposed by tartaric acid, the acid liquor yields on distillation traces of a volatile fatty acid, which has been called *phocenic acid*. Like other oils, it is very combustible, and it is largely employed for the purpose of giving light by burning in situations in which its use is not precluded by its disagreeable smell. Its composition does not appear to have been exactly ascertained; but it probably is not very different from that of the oil next to be mentioned, which is the

Spermaceti Oil, obtained from an oily matter lodged in a bony cavity of the head of the *Physeter macrocephalus*, or spermaceti whale. When this substance is subjected to pressure in bags, a quantity of pure limpid oil is expressed; and the residue, after being melted, strained, and boiled with a weak solution of potash, is well known by the name of *spermaceti*. This oil is more pure and has a much less disagreeable smell than common whale oil, and it burns much more brilliantly in lamps. According to Dr. Ure, spermaceti oil consists of—

Hydrogen	11·8C
Carbon	78·00
Oxygen	10·2C
	100·

The *Vegetable Expressed Oils* vary in their general properties: most of them are fluid at usual temperatures; such as olive oil and linseed oil; and these possess but a slight degree of colour; whereas cocoa-nut oil and palm oil are at common temperatures soft butyraceous solids, and the last mentioned is of a reddish yellow colour. The first vegetable expressed oil which we shall describe is one which is well known and most extensively employed, viz.

Olive Oil.—[OLEA EUROPÆA.]—The colour is yellowish, the odour and taste but slight. Its specific gravity is about 0·916, and consequently it floats on water, not being miscible with it. It congeals at about 36° Fahr., yielding small particles of stearin, which sink in the remaining fluid portion of oil; at 28° Fahr. it deposits 28 per cent. of stearin, the remainder being olein or elain. When heated to between 500° and 600° Fahr., it suffers decomposition; by exposure to the air it becomes rancid, especially when originally of inferior quality or adulterated with poppy oil. It dissolves in alcohol and æther, but in very small quantity. The more solid portion of vegetable oils is by some chemists called *margarin*, the term *stearin* being used only for the solid portion of animal oils.

This oil consists of olein and stearin or margarin, in the proportions of about 72 of the former and 28 of the latter. According to Saussure these are composed of—

	Olein.	Stearin.
Carbon . .	76·034	82·170
Hydrogen . .	11·545	11·232
Oxygen . .	12·068	6·302
Azote . . .	0·353	0·296
	100·	100·

The azote is so small in quantity, that if even actually present, it can scarcely be deemed more than accidental; and neglecting it, we shall find by calculation that taking the olein and stearin in the proportions stated, the ultimate analysis of olive oil will be nearly—

Carbon . . .	78
Hydrogen . . .	11·5
Oxygen . . .	10·5
	100·

Linseed Oil is expressed from the seeds of the common flax, *Linum usitatissimum*. When no heat is employed in the pressing, it is more viscid and has a greenish-yellow colour; it is then called in commerce *cold drawn* linseed oil. Its mean specific gravity is about 0·930. Its smell and taste are stronger and more disagreeable than those of olive oil. Linseed yields about 22 per cent. of oil; at −4° Fahr. it becomes paler coloured, but does not deposit any stearin on congealing, but at 5° lower it becomes a solid yellow mass; it has however been stated that when exposed for several days to a cold of 4° Fahr. it becomes solid. Linseed oil is soluble in 5 parts of alcohol when boiling, and 40 parts when cold; by æther it is much more readily taken up, 1·6 part dissolving 1 of the oil. When this oil has been long kept in a bottle partly filled, it becomes thick, and much more soluble in alcohol.

According to Saussure, linseed oil is composed of—

Carbon . .	76·014
Hydrogen . .	11·351
Oxygen . .	12·635
	100·

When this oil is kept in a vessel imperfectly closed, in a cellar, a white fatty sediment and a brown powder are deposited. The former contains the stearin of the oil mixed with impurity insoluble in æther, which dissolves the stearin, and this crystallizes by the spontaneous evaporation of the æther. The stearin is soluble in 100 parts of cold alcohol, in 40 of boiling anhydrous alcohol, and 50 parts of cold and 20 of boiling æther; it is with great difficulty converted into soap. Linseed oil is largely employed in oil-painting and in varnish-making.

Almond Oil is another important fat oil, obtained, like the preceding, by pressure, and indifferently from sweet almonds

or bitter. It is of a light yellowish colour, more fluid than olive or linseed oil; its odour and taste are very slight. Its specific gravity is about 0·917. When exposed to the air, it becomes colourless and rancid; it is soluble in 25 parts of cold and 6 of boiling alcohol, and æther dissolves it readily. According to Braconnot, when cooled to 15° it yields 24 parts of stearin, which melts at 43° Fahr., and 76 of olein, which does not solidify by exposure to the lowest temperatures; these statements have not however been confirmed by other chemists, and it has even been asserted that it contains no stearin whatever. This oil, according to Saussure, consists of—

Carbon . .	77·403
Hydrogen . .	11·481
Oxygen . .	10·828
Azote . .	·288
	100·

It is employed sometimes in soap-making, and also in medicine.

Castor Oil is the expressed oil of the seeds of the *Ricinus communis*, a biennial plant, cultivated both in the old and new continent. When expressed without the assistance of heat, it is transparent and nearly colourless, or has only a slight yellowish tint; that which is quite colourless appears to have been rendered so by artificial means, and is much diminished in efficacy. It is very considerably viscid, and becomes solid when exposed to about 0° Fahr. Its specific gravity is about 0·960. It has scarcely any taste or smell. When exposed to the air it becomes thicker and rancid. It differs from most other fixed oils in being entirely miscible with alcohol and æther in all proportions, and it is employed only in medicine as a cathartic. By the action of heat and re-agents it is converted into numerous new compounds, which have been described by Bussy and Lecanu, in the 13th vol. of the 'Journal de Pharmacie.'

The analysis of Saussure gives as its composition,—

Carbon . .	74·178
Hydrogen . .	11·034
Oxygen . .	14·788
	100·

Having now stated the properties and composition of some of the best known and most useful of the *fluid* fixed oils, we shall briefly describe two which are *solid* at the usual temperature.

Cocoa-Nut Oil.—This oil is obtained by pressure from the kernels of the cocoa-nut, the fruit of the *Cocos nucifera*. It is white, has a slight pleasant smell, and its taste is rather agreeable; its consistence is about the same, or perhaps not quite so hard, as that of suet, and yet it contains some olein mixed with the stearin or margarin. Its specific gravity is about 0·910; it melts at 122° Fahr., and of late years it has been employed in soap-making; the stearin or margarin is also used advantageously as a substitute for wax in the manufacture of candles. It is remarkable for the little change which it undergoes by keeping; years are required to render it rancid.

Palm Oil.—This oil is of the consistence of butter, and of an orange-yellow colour; its smell is agreeable. It melts at about 103° Fahr. It becomes rancid very readily, and at the same time loses its colour. It is sparingly soluble in anhydrous alcohol, to which it imparts a yellow colour, whilst the solution in æther is of a red colour. It is stated to be composed of

Stearin or Margarin .	31
Olein	69
	100

We shall now mention the properties and composition of some of the *Volatile* or *Essential Oils*: these are fluid at the usual temperature, and with few exceptions are obtained by distillation. Essential oils are distinguished principally by the following properties from the expressed oils:—Usually they are more perfectly fluid, more combustible, have an aromatic or fragrant odour, and an acrid taste; they are volatile *per se* without decomposition, and may be distilled with water at 212°, although their boiling-point is much higher. They combine with alcohol and æther in all proportions, but combine with water only in sufficient quantity to impart their odour to it. These oils evaporate without leaving any stain on paper, and they do not saponify with the alkalis. In some instances, as those in which the volatile oils exist in great abundance, they are obtained by pressure, without the application of heat; this is the case with the oil of lemons, oranges, and bergamot; in general however they are procurable only by distillation, and this is effected by putting the herb or bark into a still with water, when the oil and water are volatilized and condensed together. Like the fixed oils, they appear to contain a harder and a softer principle; the former has been called *stearopten*, the latter *eleopten*.

The first volatile oil we shall notice is one which is extensively employed, the

Oil of Turpentine.—To obtain this oil, turpentine, a well known viscid substance, which exudes from various species of the genus *Pinus*, is put into a still with water; the oil rises in vapour, and is condensed with the water, while *rosin*, as it is usually termed, remains behind. This, it has been stated, consists of two resins, to which the names of pinic and silvic acid have been given by Unverdorben.

This oil when pure is limpid and colourless, and it possesses a peculiar, strong, and to most persons a disagreeable smell. Its specific gravity is about 0·865; the density of its vapour at 313°, compared with that of air, is 4·83 to 1. This oil is but slightly soluble in alcohol which contains water; 100 parts of alcohol, of 0·84 sp. gr., dissolve 13·5 parts at 72° Fahr. Like other essential oils, it is extremely inflammable, burns with much flame, and with the formation of water and carbonic acid, as is also the case with the fixed oils. Its boiling point is about 314°. It is composed of

Five equivalents of Carbon .	60	or	88·24
Four equivalents of Hydrogen .	4	or	11·76
	64		100·

It is largely employed in the arts as a solvent in varnish-making and in house-painting.

Oil of turpentine dissolves the fixed oils and several other bodies with great facility. Thus iodine, camphor, and resins are soluble in it to a considerable extent. It is stated that it is capable of dissolving 163 times its volume of hydrochloric acid gas, provided it be kept cool; the resulting compound is a crystallized substance bearing considerable resemblance to camphor, and has been called *artificial camphor*. Great difference of opinion prevails among chemists as to the precise nature of oil of turpentine and the mode in which its elements are combined.

Oil of Lemons, commonly called *Essence of Lemons*, is one of the few essential oils obtained by pressure and not by distillation. It is extracted from the rind of the lemon, and is imported from the south of Europe. Its properties are, that it is limpid, and has a light yellow colour; it has an agreeable odour resembling that of lemons, and, like other essential oils, its taste is acrid. Its specific gravity is about 0·847: it remains fluid even when cooled down to 4° Fahr. It dissolves in absolute alcohol in all proportions, but is less soluble in alcohol containing water.

According to Dumas it is composed of

Carbon . . .	88·45
Hydrogen . . .	11·46
	99·91

It is therefore probably composed of exactly the same proportion of its elements as oil of turpentine, and, like this, it combines and forms a peculiar compound with hydrochloric acid gas. It is used in perfumery.

The two volatile oils now described may be taken as types of those which consist entirely of carbon and hydrogen, but the greater number of them contain oxygen also. Among these are the oils of lavender, peppermint, rosemary, spearmint, and marjoram; the properties of this last only we shall deem it requisite in this place particularly to notice.

Oil of Marjoram.—This oil is obtained from *Origanum vulgare*, and, according to Dr. Kane, has a specific gravity of 0·890: it generally contains a large but not a constant quantity of stearopten, and when purified from this by repeated distillation, Dr. Kane found its specific gravity to be 0·8673, and its boiling-point was 322° Fahr.

This yielded, by Dr. Kane's analysis, such proportions of its elements as showed that it was constituted of, according to his equivalent numbers,

Fifty equivalents of Carbon	307	or	86·48
Forty equivalents of Hydrogen	40	or	11·27
One equivalent of Oxygen	8	or	2·25
	355	or	100·

The volatile oils which have been alluded to or described are all lighter than water, but there are some which are heavier than this fluid, and consequently sink in it; such are the oils of cinnamon, cloves, and cassia.

There are certain volatile oils which are poisonous, on account of the hydrocyanic acid which they contain: the most remarkable of these is the oil of bitter almonds; this however ceases to be poisonous when deprived of the hydrocyanic acid. Similar or analogous oils are obtained by distilling other substances with water, as laurel leaves, peach leaves, &c.

As an instance of an oil produced by the agency of heat upon animal matter, we shall briefly mention what has long been known by the name of Dippel's oil, from having been first obtained by a person of that name. When animal matter, such as the hoofs or horns of animals, is submitted to destructive distillation in retorts, there comes over with the other products an oily substance which has a very disagreeable odour and a dark colour; by repeated distillation the latter is got rid of, but the former remains, although the oil becomes light and limpid. It was formerly much used in medicine, but is not now employed.

The last example which we shall give is that of the formation of an oleaginous body by direct chemical action: it is the *Oleum Æthereum*, or Oil of Wine of the Pharmacopœia. When alcohol is distilled with twice its weight of sulphuric acid, an oleaginous compound is procured, which, after treatment with potash and exposure to the air, has the following properties: it is a yellow fluid, of a penetrating aromatic odour and a sharp bitter taste; its specific gravity is variously stated from 1·050 to 1·133, and there is some doubt whether its composition is not also variable, dependent upon the different quantities of a peculiar carburetted hydrogen which it is apt to contain.

According to Hennell, it contains

Sulphuric acid	38·	or nearly one equivalent	40
Carbon .	53·7	or nearly nine equivalents	54
Hydrogen	8·3	or nearly nine equivalents	9
	100·		103

The analysis of Serullas differs however considerably from this.

OILS, VEGETABLE, are divided by chemists into fixed and volatile, and the former into such as are drying, fatty, and solid. They may be considered with respect to the sources whence they are obtained, their abundance, and the probability of their being used as substitutes for the whale and sperm oils, which are becoming every day dearer from their comparative deficiency. Considerable prejudice is entertained against the employment of vegetable oils, in consequence, in some measure of their inferiority, and also because they are apt to undergo decomposition, but likewise because it is difficult to separate the other vegetable principles from the oil, and the chemical means adopted for their purification render some still more impure as oils. But that many of these are very valuable is evident from several being imported in large quantities from the countries where they are produced, and hence forming important articles of commerce. In many countries they are solely employed for all the purposes for which animal oil is alone thought applicable in England. The high price of the latter has however induced dealers to mix with them a portion of the despised oils of the vegetable kingdom. This subject appears interesting and sufficiently important to induce chemists to ascertain the properties of each kind of vegetable oil, as fitted either for burning in lamps for soap or candle making, and their numbers are sufficiently great to render it highly probable that some will be found eligible for all these purposes. Many are noticed under the heads of the plants which yield them, as the cocoa-nut, palm, olive, and croton oils. Linseed and hempseed are both imported in large quantities from the north of Europe, and the former, of late years, also from India, whence also sesamum or *til* seed is also largely imported, as well as from Egypt. Oil, both volatile and fixed, is very extensively diffused through vegetables; the former in almost every part of a plant except the cotyledons of the seed, and the latter in the seeds chiefly, but also in their fleshy covering, as in the olive, some palms, the fruit of Melia, and others. Some families of plants abound especially in this principle, and therefore several species yield it, as among the Cruciferæ we have mustard, rape, and colza seed oil, with other species especially cultivated in Europe, India, and Japan, of which some have of late years been imported into this country. Several of the family of Compositæ secrete oil in quantities large enough to render it desirable to cultivate them for this purpose alone, as the sunflower and Jerusalem artichoke, also some species of Carthamus or bastard saffron, and also the Verbesina sativa of India, now known to be identical with the Abyssinian *Guizotia oleifera*, and of which the oil is known in commerce by the name of Hutsyellow oil. So *Madia sativa* yields Madi oil, and its seeds are said to be more abundant in oil than any plant introduced into Europe. Most of the Cucurbitaceæ also, as the melon, gourd, cucumber, and the numerous varieties, cultivated especially in India, contain a large proportion of oil, which is expressed in the East, as it formerly was in Europe. The Rosaceæ also store up a large proportion of oil in the kernels of their fruit, as in the almond, which is particularly valued; so also that of the apricot, as well as that of the Briançon apricot, and other species of Prunus. In the Himalayas, oil is also expressed from the apricot kernel, and has been sent to this country, of a fine quality.

Among the *Amentaceæ* we have also several species which yield oil of good quality, and in sufficient quantity to repay the expense of expression, as nut oil, obtained from the hazel; beech-nut oil, from *Fagus sylvatica;* with these may be mentioned walnut oil, from *Juglans regia.* Besides these, poppy oil, Ben-nut oil (*Hyperanthera*), ground-nut oil (*Arachis*), physic-nut oil (*Jatropha*), are well known. So the cotton-seed yields oil, which is also the case with the seeds of the tea-plant, especially of the species called *Thea oleifera*, and some of the Camellias.

In the article BASSIA it has been mentioned that two species, *B. longifolia* and *B. latifolia*, both yield oil; another species, *B. butyracea*, yields a vegetable butter, and is commonly known as the Ghee, or butter-tree of Almora. The native name of this tree is *choonee*, and Mr. Traill describes it as not being found in Kemaon, but in the adjoining Goorkhal province of Dotee. Of this an analysis has been given by Mr. E. Solly, in the 'Proceedings of the Royal Asiatic Society.' He describes it as being solid at ordinary temperatures, and that at about 120° Fahr. it is perfectly melted, and appears then as a pale yellow oil. He found a specimen of the Phoolwa, as the butter is called, which was brought to this country five years ago by Mr. Traill, to consist of sixty parts of solid oil, thirty-four of fluid oil, and six parts of vegetable impurities. The whole is readily soluble in warm alcohol, and might therefore be employed for liniments. It makes excellent soap, and burns with a bright flame, without smoke or smell, and would therefore, Mr. S. conceives, be superior in some respects to the piney tallow. In the above Proceedings of the Committee of the Asiatic Society for 1839, there are notices of several other vegetable oils sent by the Bombay Chamber of Commerce for analysis and examination by practical men as to their useful properties. The other solid oils are much better known, and may be referred to the articles COCOS, CROTON OIL, PALM OIL, LAUREL, MYRISTICA, and CACAO.

OISE, a river in France belonging to the system of the Seine. [SEINE.]

OISE, a department in France, bounded on the north by the department of Somme; on the east by that of Aisne; on the south by those of Seine et Marne and Seine et Oise; and on the west by those of Eure and Seine Inférieure. Its form approximates to that of a parallelogram, having its northern and southern sides of 60 and 65 miles respectively, and its eastern and western sides of 42 and 38 miles. It is included between 49° 3′ and 49° 46′ N. lat. and 1° 40′ and 3° 8′ E. long. The area of the department is estimated at 2256 square miles, being a little below the average area of the French departments, and rather larger than the conjoint areas of the adjacent English counties of Derby and Stafford. The population, in 1831, was 397,725; in 1836 it was 398,641; showing an increase of 916, or less than one-quarter per cent. in five years, and giving about 177 inhabitants to a square mile, being above the average of the French departments, both in amount and density of population, but far inferior in both respects to the English counties with which we have compared it. Beauvais, the capital, is on the river Terrein, a feeder of the Oise, 39 miles in a direct line north by west of Paris, or 41 miles by the road through St. Denis and Beaumont-sur-Oise.

This department has no mountains nor any lofty hills: the surface consists of gentle undulations. The highest ground extends across the department from east to west,

not very far within the northern boundary, and separates the basin of the Seine from that of the Somme. That part of the department which is comprehended in the former basin is by far the larger, and is watered by the Oise and its tributaries. The Oise enters the department near the north-eastern angle between Chauny and Noyon, and flows in a tolerably direct line of 55 miles south-west through the department, passing Noyon, Compiègne, Pont-Sainte-Maixence, and Creil, between which last town and Beaumont it quits this department to enter the adjacent one of Seine et Oise. It is navigable throughout that part of its course which is in this department. The Aisne, which is also navigable, enters the department on the east side, and has a tolerably direct course of 12 miles west by north into the Oise above Compiègne. Below the junction of the Aisne the Oise receives the Breaches, or Brêche, and the Terrein, or Therain, on the right bank and the Autone; or Authonne, the Nonette, and the Thève, on the left. These are all small: the Terrein, the longest of them, has a course of about 45 miles south-east; neither of them is navigable. The Ourcq, a feeder of the Marne, just crosses the south-eastern angle of the department, and is navigable for a few miles; and the Epte, a feeder of the Seine, forms in one part the western boundary. Some of the feeders of the Somme have their sources within the northern boundary of the department, but they are all unimportant.

The official statement of the inland navigation of the department is as follows:—Oise, 65 miles; Aisne, 13; Ourcq, 6 miles: total river navigation, 84 miles. Canal parallel to the Oise, 17 miles; Canal of the Ourcq, 5 miles: total of canal and river navigation, 106 miles.

There are several pools and marshes.

The greater part of the department is occupied by the chalk formation which surrounds the Paris basin: the southern part is occupied by the strata of the supracretaceous group. There are no metallic ores; but marble, freestone for building, some of it of superior quality, sandstone for paving, millstones, gypsum, lignite (the ashes of which are used for manure), and potters' earth, are dug. Fossil remains are abundant; and round Beauvais above 1100 persons are employed in digging peat. There are several mineral springs, for the most part chalybeate, but none of much repute. There was, in 1834, only one iron-work in the department, having two forges for the production of wrought-iron.

The department is traversed by twelve Routes Royales, or government roads, having an aggregate length of 365 miles, namely, 341 in good repair, 12 out of repair, and 12 unfinished. The principal road is that which leads from Paris through Beauvais and Marseille to Abbeville and Calais. The road from Paris to Peronne and Cambray passes through Senlis and Pont-Sainte-Maixence; that from Paris to Amiens passes through Chantilly, Creil, Clermont, St. Just-en-Chaussée, and Breteuil; that from Paris to Laon crosses the south-eastern angle; and that from Paris to Dieppe crosses the south-western angle of the department. Roads lead from Beauvais to Clermont and Compiègne, to Breteuil, and to Gournay (Seine Inférieure); from Senlis, along the valley of the Oise, by Compiègne and Noyon, to La Fère and St. Quentin (Aisne), with a branch from Noyon to Ham (Somme); and from Compiègne, on the one hand, to Montdidier and Amiens, and on the other, to Soissons. The Routes Departmentales, or departmental roads, have an aggregate length of 311 miles, namely, 246 in repair, 11 out of repair, and 54 unfinished. The bye-roads and paths have an aggregate length of more than 3000 miles. (*Official Returns*, 1st January, 1837.)

The air is temperate, and for the most part healthy: the exceptions are the neighbourhood of the various pools and marshes. The soil varies in fertility: more than 950,000 acres, constituting about two-thirds of the department, are under the plough. The produce in corn is very great, being nearly as much again as the average produce of the French departments. In wheat, which is the grain chiefly cultivated, the preponderance is yet greater, and in rye and maslin (or mixed corn), and in oats, the growth of which is all but equal to that of wheat, greater still. Barley and potatoes are cultivated, but not very extensively. Some hemp and pulse are grown: maize and buckwheat are not grown at all. Wheat and oats are exported in considerable quantity, principally to Paris and Rouen. The quantity of grass-land is about 70,000 acres; and there are 35,000 to 40,000 acres of heath or other open grazing-land. The artificial grasses most cultivated are trefoil and lucerne. There are only about 6000 acres of vineyards, and the wine grown is, with little exception, of very inferior quality. The wines of Bourgogne and Champagne are chiefly consumed. Orchards and gardens occupy about 35,000 to 40,000 acres: a considerable quantity of cider is made. The woodlands comprehend about 200,000 acres. The principal forests are those of Compiègne (about 35,000 acres), Chantilly, Ermenonville, and Le Lys.

The number of horses in the department is nearly double the average number in the other departments; they are for the most part brought from the department of Pas de Calais, where they are bred. The number of neat cattle is not equal to the average of France. The calves reared in the department furnish the markets of Paris with some of their most delicate veal. The number of sheep is great, and the produce of wool considerable: the breed has been much improved by crossing with the English (Leicester and South-down) and Merino breeds. A portion of the wool is employed by the manufacturers of Beauvais and the valley of the Oise. A considerable quantity of pork and poultry is fattened for the supply of Paris, and bees are commonly kept. The larger game, stags, roes, and wild boars, are found in the woods, and the rivers abound with fish.

The department is divided into four arrondissements, as follows:—

		Sq. M.	Population. 1831.	Population. 1836.	Communes
Beauvais	W.	749	131,385	132,369	234
Clermont	N.	501	89,448	89,837	161
Compiègne	N.E.	494	97,812	97,645	156
Senlis	S. & S.E.	512	79,080	78,790	132
		2256	397,725	398,641	683

The number of cantons, or districts, each under a justice of the peace, is thirty-five.

The arrondissement of Beauvais includes the towns of Beauvais (pop. in 1831, 12,867; in 1836, 13,082) [Beauvais], Gerberoy, and Songeons, on the Terrein; Marseille and Milly, on the Petit Terrein; Grandvillers, or Grandvilliers (pop. 1811), Formerie, La Bosse, Chaumont, and Meru. Gerberoy is on an eminence. It is now an insignificant place, but was antiently a frontier fortress toward the duchy of Normandie, and was exposed to frequent assaults. It suffered much in the wars of the English in France, and in the religious wars of the sixteenth century. The fortifications of the town, which had been dismantled, were subsequently restored. It is surrounded with pleasant walks, and the townsmen carry on some trade in horses and cattle. It has two yearly fairs. Songeons is pleasantly situated at the foot of a hill, and consists of well-built brick houses. Spectacles and looking-glasses are manufactured, and trade is carried on in iron goods and other hardwares, coal, corn, cider, and cattle. It has four yearly fairs. Marseille is well built of brick and in a pleasant situation. The townsmen manufacture leather, and trade in cattle: there are five yearly fairs. At the village of Achy, in the neighbourhood of Marseille, yarn is spun of wool, camels' hair, and silk. Grandvillers is on the road from Paris to Abbeville: it has wide streets converging in a large market-place: the inhabitants manufacture woollen cloth, serge, hosiery, toys, and soap. Hosiery and serge are also made in the neighbourhood, and the town is the centre of a considerable trade in these articles, and in corn, brandy, cider, coal, cattle, and horses. In the neighbourhood are two castles, that of Damerancourt, a strong fortress of the feudal ages, and that of Sarcus, built early in the sixteenth century, in a rich style of architecture. Chaumont is built on the slope of a hill, the summit of which is crowned by the parish church. Woollen cloths, lace, leather, and fans are made; there are water-mills and lime-kilns; and trade is carried on in corn, hay, wood, and woollen goods. The population of the commune is about 1800. Meru is the centre of a considerable manufacture of horn, mother-of-pearl, bone, ivory, hard wood, and other toys: nearly fifty men were employed a few years since in making fans alone. At the neighbouring village of St. Geneviève, two hundred workmen are employed in finishing these toys. Agricultural implements, snuff, leather, and lace are also made; and trade is carried on in corn, cattle, horses, and wool. In and around Auneuil, a village between Beauvais and Chaumont, eight hundred females are employed in lace-making; and in and about

the village of Nivillers, near Beauvais, about the same number are engaged in spinning hemp, in combing and spinning wool, and weaving stockings. At the village of Hanvoile, near Songeons, a great quantity of serge is made; and at Savigniès and La Chapelle-aux-pots, near Beauvais, are extensive potteries.

In the arrondissement of Clermont are—Clermont (pop. in 1831, 2594 town; 2715 whole commune; in 1836, 3235 commune) and Bulles, on the Bresches or Brêche; St. Just en Chaussée, near the head of the Arre, a small tributary of the Bresches; Mouy (pop. 1817 town, 2372 commune) on the Terrein; Breteuil (pop. 2244 town, 2284 whole commune) on the Noye, a feeder of the Somme; and Crèvecœur. Clermont, distinguished from other places of the same name as Clermont-Oise or Clermont en Beauvais, was at first probably a border castle erected as a barrier against the Normans. In the tenth century it became the capital of a county, which, in the thirteenth century, was conferred by St. Louis on his son Robert, ancestor of the house of Bourbon. The town is pleasantly situated on the slope of a hill, the summit of which commands an extensive and beautiful prospect, and is crowned by an antient castle. At the foot of the castle wall is an agreeable public walk. The principal manufactures of the town are cotton yarn, printed and other calicos, and linens; there are bleaching grounds, brewhouses, tanyards, and saltpetre refineries; and trade is carried on in corn, cattle, horses, flax, and linens. The surrounding country is remarkable for the growth of cherries. Clermont has a large monthly corn-market and fifteen yearly fairs. Bulles has a population of about 1000: the townsmen spin flax and manufacture fine linens. There are oil-presses. St. Just en Chaussée was formerly a walled town and of greater extent than at present; it is about as populous as Bulles. The townsmen manufacture hosiery, and trade in cattle and wooden wares. Mouy is the centre of a considerable woollen manufacture, which employs in the town and neighbourhood about 1200 workmen. The washing of the wool and the dyeing and finishing of the cloth are carried on in the town. There is a good weekly market, also a yearly fair. Breteuil has probably risen from the decay of a Gaulish town (the Bratuspantium of Cæsar, *Bell. Gal.*, lib. ii., c. 13), the traces of which, called by the people around Brantuspante, have remained till the present time. A number of vases, coins or medals, and other antiquities have been dug up. The townsmen make shoes for the troops and for the hospitals of Paris; worsted stockings, serge, shawls, and other woollen goods; paper, earthenware, and leather; they trade in corn, cattle, and cider. There are good nursery-grounds round the town. Crèvecœur has an antient castle built of brick, with a walled park and gardens. The inhabitants, who exceed 2000, are engaged in the manufacture of woollen stuffs; and trade in corn, trefoil and lucerne seed, cattle, and horses.

In the arrondissement of Compiègne are—Compiègne (pop. in 1831, 8879; in 1836, 8895) [COMPIEGNE] and Noyon (pop. 5535 town, 5946 whole commune), on or near the Oise; and Pier-fond, about 7 miles south-east of Compiègne. Noyon is mentioned in the 'Itinerary' of Antoninus and the 'Notitia Imperii' under the name of Noviomagus. In the fifth century the bishop's see was transferred hither from Augusta Veromanduorum, now St. Quentin. Pepin le Bref began and Charlemagne (who was crowned here) finished the erection of the cathedral; and at Noyon, Hugues Capet was elected king. It was taken by the League, A.D. 1593, and retaken the next year by Henri IV. The town is well laid out and well built, at the foot and on the slope of a hill, and is traversed by the two branches of the little river Vorse, which flows into the Oise a short distance from the town. It has four gates, which take their names from the four suburbs, and several fountains. The cathedral is a large building, about 340 feet long, with two towers of the height of 200 feet. There are an antient episcopal palace, a seminary for the priesthood, an hospital, and pleasant public walks. The bishop's see no longer exists. The townsmen manufacture linens, muslins, hosiery, and leather; and trade in corn, hosiery, hides, and vegetable ashes. Pier-fond or Pierre-font had a strong castle, which was obstinately defended by the leaguers against the troops of Henri IV. It was dismantled by Louis XIII., and now forms one of the most picturesque ruins in the country.

In the arrondissement of Senlis are—Senlis (pop. in 1831, 5066; in 1836, 5016) [SENLIS] and Nanteuil-le-Hardouin, on the Nonette; Pont-Sainte-Maxence (pop. 2453 town, and 2575 whole commune) and Creil, on the Oise; Merlou or Mello on the Terrein; Chambly, on the brook Méru, which flows into the Oise; Crespy or Crépy (pop. 2242 town), and Acy or Assy. Nanteuil has the ruins of an antient castle, the residence of François and Henri, the celebrated dukes of Guise, and of an antient Cluniac priory. The townsmen (about 1300 or 1400 in number) carry on some manufactures, and trade in corn and cattle. Pont-Sainte-Maxence or Maixence is in a pleasant situation, and is remarkable for a handsome bridge of three arches, erected in 1777, in the place of a more antient one supposed to have been built by the Romans. Each corner of this bridge is adorned with an obelisk, and the piers are composed each of four columns arranged two on each side, with an interval of 9 or 10 feet between them. The inhabitants are engaged in tanning leather, and they trade in corn (a considerable quantity of which is sent to Paris), wine, and cattle. It has a good weekly market, and a fair every month. In the neighbourhood are the ruins of the antient and rich abbey of Moncel. Creil is pleasantly situated. On an island in the Oise are some remains of an antient castle built by Charles V., and of an antient abbey. The town was pillaged by the Huguenots in 1567, and subsequently taken by the League. The principal manufacture of the place (which has a population of about 1500) is of earthenware, porcelain, pottery, and glass, which gives employment in and about the town to 900 workmen. Some printed cottons are manufactured, and trade is carried on in coal, corn, flour, and cattle. In the district round the town manufactures are carried on; and there are several stone quarries, where the workmen live in habitations excavated in the rock. Merlou or Mello has an antient castle on a picturesque and commanding eminence, at the foot of which lies the little well-built town, of 400 or 500 inhabitants, who weave cachemire shawls, merinos, calicos, and laces. Turf is dug in the neighbourhood, and some trade in cattle is carried on. Chambly has about three times the population of Merlou; the streets are wide and well laid out; and the houses well built; there is a pleasant public walk. The inhabitants make laces, braid, and blond lace; and there are tile-works and several flour-mills. Some trade in flour is carried on. Crépy or Crespy was the capital of the county (afterwards duchy) of Valois, and in the feudal ages was a place of great strength. In 1431 it was taken by the English, who are said to have destroyed fifteen hundred houses. The strong castle of the counts of Valois was also taken and destroyed. The town was retaken by the French in 1533. In 1544 a treaty was concluded at Crépy between François I. and the emperor Charles V. In 1588 the town was taken by the League and retaken by Henri IV. It is surrounded by a public walk planted with trees, and is entered by five gates. The columns of the choir of the parish church are remarkable for their lightness and beauty. Part of the walls of the town and of the old castle are standing. The manufactures are lace, cotton goods, leather, and, in the environs, home-spun linen; trade is carried on in corn, wood, cattle, horses, thread, and woven goods. There are two yearly fairs. In this arrondissement are the villages of Chantilly, where were the magnificent park and palace of the princes of Condé, destroyed in a great part during the Revolution; and of Ermenonville, where Rousseau died (A.D. 1778) and was buried. His tomb remains, but the body was removed to Paris, A.D. 1794.

The population of the towns, when given accurately, is, unless otherwise stated, from the census of 1831, and is that of the whole commune; when only an approximation is given, the authority is Dulaure's *Histoire des Environs de Paris*, Paris, 1825-28.

The manufacture of toys is carried on in the villages between Meru and Beauvais; that of optical glasses and mirrors around Songeons; bricks, tiles, crucibles, sugar-refiners' pots, and other pottery, between Beauvais and Songeons and around Songeons; cotton yarn at various places in the arrondissement of Beauvais. In the district round Creil manufactures and establishments of various kinds are carried on with great activity; porcelain, earthenware, glass, woollen, linen, and cotton yarn, and goods, lace (at Chantilly), silk and cotton buttons, brass and iron wire, and paper are made; stereotype and other printing, bleaching, card-making, sheet-copper and iron works, and flour-mills are in active operation. The industry of this district owes much to the duke of La Rochefoucauld. The morality of the humbler classes has been improved by the

introduction and progress of manufactures, and by the attention of the capitalists engaged in them. The principal manufactures of the arrondissement of Compiègne are of cotton. The extension and improvement of the manufactures of the department are owing to the industry and skill of persons from other parts rather than to the inhabitants.

The department constitutes the diocese of Beauvais, and is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Amiens. It is in the first military division, the head-quarters of which are at Paris. It sends five members to the Chamber of Deputies. In respect of education it is above the average of France; of the young men enrolled in the military census of 1828-29, more than half (54 in every 100) could read and wrote.

In the most antient period of the history of France, this department was chiefly comprehended in the territory of the Bellovaci; portions of it were included in the territories of the Silvanectes, the Vadicasses, the Suessiones, the Veromandui, the Ambiani, and the Velocasses, all of them Belgic nations, and all afterwards included in the Roman division of Belgica Secunda, except the Veliocasses, who were included in Lugdunensis Secunda. Of Gallic and Roman towns and stations the chief within its limits were Cæsaromagus, afterwards Bellovaci, Beauvais; Bratuspantium, near Breteuil; Litanobriga, Pont-Sainte-Maixence, or more probably Creil; all in the territory of the Bellovaci; Noviomagus, Noyon, in the country of the Veromandui; Augustomagus, afterwards Silvanectes, Senlis, in the territory of the Silvanectes; and Næomagus, probably Vez, a village near the Authonne, in the territory of the Vadicasses. There are the traces of a Roman camp between Beauvais and Clermont.

Before the Revolution the department was included in the districts of L'Ile de France proper, Valois, Noyonnais, and Soissonnais, in the military government of L'Ile de France, and in the districts of Santerre and Amienais in Picardie.

OKA, River. [RUSSIA.]

OKHOTSK, a commercial town, situated on the northern shores of a wide gulf of the Pacific Ocean, which separates the peninsula of Kamtchatka from the continent. It is in 59° 20′ N. lat. and 145° 18′ E. long. The town was formerly built on a flat sandy neck of land, about two miles in width, and washed on one side by the river Ochota, and on the other by the sea. But as its low situation rendered the place extremely unhealthy on account of the fogs in which it was frequently enveloped, and also exposed it to inundations during southern and south-eastern gales, the town was removed a few years ago about three miles farther up the river. It is now built on a low hill rising about thirteen feet above high-water mark, on the right bank of the Ochota. The town is small, consisting only of a few hundred houses, and the inhabitants are estimated not to exceed 2000. But as it is the only place by which the intercourse between the interior of Siberia on one side and the peninsula of Kamtchatka and the Russian dominions in North America is maintained, it has a considerable commerce, though, owing to the sterility of the adjacent country, it has no article of exportation except a small quantity of furs. The Russian American Company, whose wealthy partners reside in the town of Irkutsk, build vessels here from time to time, but at a great expense, as the timber must be brought down from the woods, which are more than fifty miles distant. The furs brought from America are landed here, and transported by land through Yakutsk to Irkutsk, and thence to Kiachta, to be exchanged for articles of Chinese production. The harbour is very bad. It is formed by the river Ochota, which, meeting the sea by a rapid course, has formed at its mouth a sand-bar, with only nine feet of water on it. Besides this, it is only accessible from June to September, being blocked up with ice and snow the remainder of the year. The Russian government has accordingly resolved to select another place on the coast of the Bay of Okhotsk, which offers a better harbour, and to build there a new town. According to the most recent information, the mouth of the river Uda (54° N. lat. and 136° E. long.) offers considerable advantages, having a fine harbour sheltered by the Shantar Islands.

(Sauer's *Account of Billing's Geographical and Astronomical Expedition to the Northern Parts of Russia;* Langsdorf's *Voyages and Travels in various Parts of the World;* Saryschef's *Voyages of Discovery to Siberia, &c.;* Erman's *Reise um die Erde durch Nord Asien und die beiden Oceane.*)

O'KHRIDA, a town of Albania, in European Turkey, situated on the north-eastern shore of a considerable lake, which takes its name from the town. According to the map of Albania prefixed to Hughes's 'Travels' (2nd edit., 1830), Okhrida is in 41° 3′ N. lat. and 21° 5′ E. long.

Okhrida is on or near the site of the antient Lychnidus (Λυχνίδους, or perhaps Λύχνιδος, Strabo). This town of Lychnidus gave antiently its name to the lake which was called ἡ λίμνη Λυχνῖτις or Λυχνιδία. The town lies at the foot of an eminence, the summit of which is crowned by a castle, in which the Turkish governor of the surrounding province resides. The population of the town is estimated at about 6000, chiefly of Bulgarian descent. Silver ore and sulphur are procured from mines near the town. A Greek archbishop resides here.

The lake of Okhrida extends about 18 miles from south-east to north-west, and is 6 or 8 miles across in the widest part. It is in the valley watered by the Black Drin, which flows through the lake in the direction of its length. There are several villages round the shore. It abounds with fish; and the fishery is actively carried on.

The pashalick or district of Okhrida is not very large; but in the uncertain state of Turkish geography we do not attempt to define its boundaries or dimensions. The district is mountainous, and is said to be well wooded; it is watered by the Black Drin and the Scombi. It is tolerably productive in corn, maize, rice, tobacco, cotton, hemp, fruit, and wine. Cattle and bees are reared, and game is tolerably abundant. The inhabitants are distinguished by their courage and ferocity, and are reputed to make the best soldiers among the Albanians.

OLACA'CEÆ. This name applies to a small and little studied natural order of Exogenous plants, chiefly found within the tropics. Its most important characters are a small inferior calyx, often becoming enlarged around the ripe fruit, a polypetalous valvate corolla, a small number of hypogynous stamens, partly fertile and partly barren, a one-celled ovary, with pendulous ovules, indehiscent fruit, and a small embryo amongst a large quantity of albumen. Its affinities are little understood, but are supposed to be greatest with Pittosporaceæ, on the one hand, and Aurantiaceæ, on the other. The plants are of little importance for useful qualities; one species, Heisteria coccinea, yields, it is said, the partridge-wood of cabinet-makers, and the fruit of others is eatable when ripe, though not very pleasant. (Lindley's *Natural System of Botany*, ed. 2, p. 33.)

OLA'US, MAGNUS, a native of Sweden, and brother to John Olaus, archbishop of Upsala, was an archdeacon in the Swedish church when the Reformation, supported by Gustavus Vasa, gained the ascendency in Sweden. In consequence of this change the two brothers, who remained attached to the Roman Catholic faith, left their country and retired to Rome, where Olaus Magnus passed the remainder of his life in the enjoyment of a small pension from the pope. At Rome he wrote his work, 'Historia de Gentibus Septentrionalibus, earumque diversis Statibus, Conditionibus, Moribus, itidemque Superstitionibus, Disciplinis, &c.,' Rome, fol., 1555, and Basil, 1567. Other editions of this work have been published, which, as well as a French translation in 1561, are all incomplete. The work is minute, and contains some curious information, but is uncritically written. Olaus died at Rome in 1568. His brother John wrote a work entitled 'Gothorum Suevonumque Historia, probatissimis Antiquorum Monumentis collecta,' Rome, fol., 1554, which is a still more uncritical performance than that of his brother Magnus.

OLD RED-SANDSTONE. By this title English geologists have almost universally designated the variable series of rocks which separate the youngest slates ('Transition Rocks') from the mountain-limestone and coal. Messrs. Conybeare and Phillips (*Geology of England and Wales*) ranked the old red-sandstone in their 'Medial Order' along with the coal and mountain-limestone; and this classification has been unreservedly followed till within a short period. Mr. Murchison, in his work on the 'Silurian System,' has preferred to separate the old red-sandstone from the superincumbent strata, and to constitute for it an additional system. Since the publication of that work, the same author, in conjunction with Professor Sedgwick, believing that the limestones and slaty and conglomerate rocks of South Devon belong to the same geological period as the true old red-sandstone of Herefordshire, and desirous

of improving the nomenclature, has proposed for these variable strata the title of the Devonian System. If the evidence of the correspondence of geological age, between the calcareous and slaty strata of South Devon and the red-sandstones of Herefordshire, should become strong enough to command the assent of geologists, the settlement of an appropriate name will not be without difficulty, especially if we remember that the continental types of stratification ought to be included in a good general appellation.

Confining ourselves then to the characters of this *formation*, or *system*, where they are most conspicuous, viz. in the districts of Monmouthshire, Breconshire, and Herefordshire, and the borders of the Cumbrian, Lammermuir, and Grampian mountains, we find in the old red-sandstone the following kinds of rocks:—

Conglomerates.—These are usually composed of a basis of red-sandstone, or red argillaceous matter, in which multitudes of large and small pebbles are imbedded. The fragments thus enclosed are usually such as may be supposed to have been derived from the neighbouring slaty rocks of older date, and they are often collected in great abundance in the lower parts of actual valleys. This is observed especially near Kirkby Lonsdale, Sedbergh, and the foot of Ullswater. Among the fragments of grauwacke, quartz pebbles occur, sometimes containing micaceous iron-ore and other products of mineral veins. The conglomerate rocks of Herefordshire, Monmouthshire, &c. contain little else than fragments of quartz, making what is called a plum-pudding-stone.

Sandstones.—In most situations these are laminated parallel to the stratification, and in Monmouthshire, Herefordshire, &c. they have interspersed mica, and yield very good flagstone.

Argillaceous Beds.—These abound in the English and Welsh series, and by their red, white, and greenish colours, often exhibited in alternate bands and spots, resemble very nearly some varieties of the upper or new red-sandstone series.

Calcareous Beds.—The limestones of this series of rocks are usually associated with the argillaceous strata, and are very peculiar in character. They lie somewhat irregularly interstratified with the clays, and partake of the same colours, reddish, whitish, greenish, the different lines being so mixed in spots as to give the stone the aspect of a breccia, or conglomerate, and to justify its local name of 'gooseberry stone.' It is in places a nearly pure carbonate of lime in massive beds, but it is very seldom employed for any useful purpose. We have seen polished fragments which might be mistaken for variegated marble.

The best general series of these rocks known is that unfolded by Mr. Murchison's examination of the country along the border of South Wales. That author presents us with the following three groups in a descending order:—

1. Quartzose conglomerate and sandstone. The conglomerates occupy a thickness of about 200 feet, and then pass down into chocolate-brown sandstones, mottled marls, &c.

2. Cornstone formation, including marly clays and the peculiar limestone above described. Fragments of fossil fishes, especially of the Cephalaspides, occur not uncommonly.

3. Tilestone. Nearest in position to the Silurian rocks, these laminated sandstones resemble them somewhat both in organic remains and mineral aspect, being however more arenaceous and micaceous, and, except in particular lines, less productive of fossils. On the surface they make a red soil, while the upper Silurians yield a grey soil.

Mr. Murchison estimates the total thickness of the old red-sandstone system at not less than 9000 or 10,000 feet. (*Silurian System*, p. 184.)

OLDCASTLE, SIR JOHN, called 'the good,' the first martyr and the first author among the nobility of England, was born in the fourteenth century, in the reign of Edward III. He married the heiress of Lord Cobham, by whom he obtained that title. He gained military distinction in the French wars under Henry IV. and V., and was a domestic and a favoured attendant of the latter. Lord Cobham was a man of extensive talents, qualified for the cabinet or the field, of ready wit in conversation, and of great learning. He examined the writings of Wickliffe as a philosopher, and in the course of his study became a convert to the doctrines of that reformer. He collected and transcribed the works of Wickliffe, maintained preachers of that persuasion, and became a leader of the reformers. Lord Cobham being summoned to appear before the archbishop of Canterbury, refused, was excommunicated, and sent to the Tower, from which he escaped into Wales. The clergy got up a report of a pretended conspiracy of the Lollards, headed by Lord Cobham, whereon a bill of attainder was passed against him, a price of 1000 marks set upon his head, and exemption from taxes was promised to any person who should secure him. At the expiration of four years he was taken, and without much form of trial executed in the most barbarous manner; he was hung in chains on a gallows in St. Giles's Fields, London, and a fire kindled under him, by which he was roasted to death, in December, 1417. He wrote 'Twelve Conclusions addressed to the Parliament of England;' he also edited the works of Wicliffe, and was the author of several religious tracts and discourses.

OLDENBURG, or HOLSTEIN-OLDENBURG, a grand-duchy in the north of Germany, consists of three distinct portions. 1. The Duchy of Oldenburg, properly so called, which lies between 52° 54′ and 53° 44′ N. lat. and 7° 40′ and 8° 45′ E. long., contains 2090 square miles: it is bounded on the north by the German Ocean; on the east by the Hanoverian province of Bremen, the territory of the city of Bremen, and the Hanoverian province of Hoya; on the south by Osnabrück; and on the west by the Hanoverian province of Meppen and East Friesland. 2. The Principality of Lübeck, which is surrounded by the duchy of Holstein, contains 180 square miles. One large portion is compact and unbroken; the remainder is scattered on the banks of the Schwartau and the Trave. 3. The Principality of Birkenfeld, which is on the left side of the Rhine, contains 170 square miles; it is bounded on the north-west and south by the Prussian province of the Lower Rhine, on the north-east by Mesenheim, and on the south-east by the principality of Lichtenberg. The area of the whole is 2440 square miles.

Surface of the Country; Soil; Climate.—The Duchy of Oldenburg Proper is a part of the great plain of Northern Germany, without mountains or hills, and without forests. Heaths and moors alternate with cultivated spots, in such a manner that the latter, as Hassel observes, are like oases in the desert. The coasts are low, and protected against the inroads of the sea, partly by dunes, and partly by dykes, like those in Holland. The mouths of the Weser and the Jahde are lined with dykes. The soil of the interior of the country is poor, but there is rich marsh land on the banks of the Weser and at the mouth of the Jahde. The principal rivers are the Weser (which however only forms the boundary between Oldenburg and the province of Bremen), the Jahde, which forms a large bay where it falls into the German Ocean, the Hunte, the Hase, and the Leda. There are no large lakes; the most considerable, the Zwischenahner Meer, is 6 miles in circumference, and its banks are surrounded by picturesque well-wooded eminences. The climate, like that of Northern Germany, is damp and subject to frequent fogs; yet on the whole it is not unhealthy. The natural productions are corn of all kinds, flax, hemp, some hops, culinary vegetables, timber for building, and wood for fuel. There are the usual domestic animals, especially very good horses, nearly equal to those of East Friesland, poultry, game, fish, and bees. There are no metals; but there is indifferent turf, pipe and brick clay, and quarry stone. The Principality of Lübeck is flat and resembles Oldenburg in its soil and climate, but it contains some beautiful lakes, especially those of Ploen and Eutin. The Schwartau and the Trave are the chief rivers. The Principality of Birkenfeld lies on the side of the mountain-range called the Hochwald, branches of which traverse it, and contain small valleys between them. The soil is in general sterile. The climate is rather cold near the mountains and on the eminences, but in the valleys it is mild and healthy. The natural productions are corn, flax, hemp, timber, fruit, and wine. The mineral kingdom affords lead, iron, coals, slate, agate, jasper, chalcedony, and lapis lazuli.

Trade and Commerce.—The chief occupations of the inhabitants are agriculture and the breeding of cattle. The farmers on the moors and marshes follow each a different system of cultivation; yet none of these systems can be called good. There is scarcely such a thing as a village, the farm-houses lying quite isolated in the centre of the farms. There are no great manufactures in the grand-duchy, but the people make considerable quantities of coarse linen, worsted stockings, and thread, which, though in general the work of the leisure hours of the country-people, are a source of

great profit. Oldenburg is extremely well situated for commerce, but the trade is chiefly a coasting trade, which is carried on in vessels with one or two masts, from twenty to forty tons burden, calculated for navigating the shallow waters (called Watten) between the sand-banks in the German Ocean, on the coasts of North Holland, Groningen, Friesland, and Germany, to the river Eider. The exports are the natural productions of the country, including 6000 horses and from 8000 to 10,000 oxen annually, and considerable quantities of linen, leather, raw hides, rags, &c., principally to Holland and the Hanseatic cities. The revenue is about 150,000*l.* sterling, and there is no public debt. Of the inhabitants, 246,772 are Low Germans and 980 Jews. The established religion is the Lutheran; there were, in 1837, 173,598 Lutherans, 70,880 Roman Catholics, 2314 Calvinists, and 980 Jews.

Education.—With respect to education, Oldenburg is rather backward. The rarity of villages renders it difficult to establish schools. There is no university, and till lately no great public library or scientific institutions. Much has however been done of late years. The various branches of a learned education are now taught in the Protestant gymnasium at Oldenburg, the Roman Catholic gymnasium at Vechta, the Latin schools at Jever and Eutin. There are likewise a normal school, a military school, a seminary for school-masters, and 2 superior Burgher schools.

Government, &c.—As a member of the German confederation, in conjunction with Anhalt and Schwarzburg, Oldenburg has the fifteenth place, or vote, in the select council of the Diet, and one vote of its own in the full council. The contingent to the army of the Confederation is 2177 men. Since 1834 Oldenburg furnishes the contingent of artillery for the Hanseatic cities, which in return furnish the contingent of cavalry for Oldenburg. The constitution is monarchical, and hitherto without an assembly of estates. The government is hereditary in the male line.

History.—The antient house of Oldenburg is one of the most illustrious in Europe: the emperor of Russia, the kings of Denmark, and the late royal family of Sweden are descended from it. Oldenburg is the original seat of the family. Christian I. founded the town of Oldenburg in 1155, and assumed the title of count. One of his descendants, Dietrich the Fortunate, obtained with his first wife the county of Delmenhorst, and with his second the duchies of Schleswig and Holstein. After Dietrich's death in 1440, his eldest son, who had for his share Schleswig and Holstein, became in 1448 king of Denmark, by the title of Christian II., in 1450 king of Norway, and in 1458 king of Sweden. He left two sons, John, who succeeded him in the northern kingdoms, and Frederic I., who had Schleswig and Holstein, and who, after the deposition of his nephew Christian II., the son of John, was made king of Denmark and Norway. His eldest son Christian III. inherited in 1513 the two kingdoms, and Adolphus, the younger, founded the house of Holstein Gottorp, which has given sovereigns to Sweden, Russia, and Oldenburg. Dietrich's younger son Gerard the Warlike inherited Oldenburg and Delmenhorst, but the male line of this branch becoming extinct in 1667, the counties fell to the Danish crown, or to the house of Holstein, descended from Dietrich's eldest son. In 1773 the grand-duke Paul of Russia, who was descended from the elder branch of the house of Holstein Gottorp, made a convention with Denmark respecting his share of Holstein, by which he surrendered all Holstein to Denmark, and received in exchange Oldenburg and Delmenhorst, which he immediately transferred to his cousin Frederic Augustus, of the younger branch of Holstein Gottorp. This convention was sanctioned by the emperor Joseph II., who gave to the two counties the rank of a duchy, and as the house of Holstein Gottorp had ever since 1647 given bishops to the see of Lübeck, he assigned it to that family as an hereditary principality. Frederic, the first duke, was succeeded in 1785 by his son Peter Frederick William, but he being afflicted with mental imbecility, the government was assumed by his cousin Peter Frederick Ludwig, the bishop of Lübeck, who in 1808 joined the Rhenish confederation. But Napoleon, by a decree of 14 December, 1810, incorporated the duchy with the French empire, and offered the duke as an indemnity the territory of Erfurt, which he refused, saying, 'I desire only subjects whom I know and love, and who love me.' After the fall of Napoleon, the duke recovered his own dominions; the congress of Vienna also assigned to him the principality of Birkenfeld; he obtained from Russia the lordship of Jever, and likewise obtained the sovereignty over the lordships of Varel and Kniphausen, which belong to Count Bentinck.

Oldenburg, the capital, in 53° 20′ N. lat. and 8° 11′ E. long., is a well built town on the navigable river Hunte; the ramparts have been converted into public walks and gardens. The population is 7800, including that of the two suburbs. The palace is a very handsome building with a fine park, or what the Germans call an English garden. There are some tanneries, distilleries, and soap manufactories in the town. The public institutions are—the gymnasium, the seminary for schoolmasters, the military school, a library of 45,000 volumes, an observatory, and a remarkable collection of antiquities chiefly of Oldenburg.

Varel, on a canal which joins the Jahde, forms a harbour which merchantmen can enter at high-water, has 3000 inhabitants. *Jever*, in a fertile country on a navigable canal, has a good trade and 3600 inhabitants. *Eutin*, which is the only town in the principality of Lübeck, is on the bank of a lake, has a palace of the grand-duke with a beautiful park, and 2700 inhabitants.

(Halem, *Geschichte des Grossherzogthums Oldenburg*, 3 vols., 1794-1796; Trundes, *Kurzgefasste Oldenbürger Chronik*, 1831; Köhlis, *Beschreibung des Herzogthums Oldenburg*, &c., 2 vols., 1824.)

OLDENBURG, HENRY, was born about the year 1626, in the duchy of Bremen. In 1653, or before, he came to London in the capacity of consul from the town of Bremen, but he does not appear to have held that office more than two years. In 1656 he became tutor to Lord Henry O'Bryan, a young Irish nobleman, whom he accompanied to the university of Oxford, and at the same time entered himself as a student, chiefly, it is supposed, in order to obtain access to the Bodleian library. He was afterwards tutor to Lord William Cavendish. While resident at Oxford he became acquainted with several of the more eminent literary and scientific men of the time, among whom were Dr. Wallis, Ward, and the other originators of the present Royal Society. His acquaintance with Milton commenced somewhat earlier, as appears by Milton's letters to Oldenburg, between the years 1654-59, published in his 'Epistolæ Familiares.' In 1662, the Royal Society having obtained a charter of incorporation, Dr. Wilkins and Mr. Oldenburg were appointed secretaries to the Society. According to most biographers the nominal appointment of Oldenburg was that of assistant secretary to Dr. Wilkins, but in the list of members who attended the first council held by the Society after its incorporation (Thomson's *Hist. of Royal Society*), we observe only one secretary specified, namely Oldenburg, and it is certain that those duties which demanded the greatest zeal and assiduity devolved exclusively upon him. Dr. Martin Lister, in his 'Journey to Paris,' 8vo., Lond., 1699, speaking of Oldenburg, remarks, 'I heard him say that he held correspondence with seventy odd persons in all parts of the world: I askt him what method he used to answer so great variety of subjects, and such a quantity of letters as he must receive weekly, for I knew he never failed, because I had the honour of his correspondence for ten or twelve years. He told me he made one letter answer another, and that to be always fresh, he never read a letter before he had pen, ink, and paper ready, to answer it forthwith, so that the multitude of his letters cloy'd him not, or ever lay upon his hands.' In the 'General Dictionary,' Lond., 1739, fol., art. 'Oldenburg,' there will be found several of his letters to Mr. Robert Boyle, who was one of his regular correspondents, and with whom he was always on the most friendly terms. The following extract from one of those letters, dated 17 December, 1667, shows that up to that time he had received no salary from the Society, and that his only emoluments were derived from the publication of their Transactions. 'I have some grounds to believe,' he remarks, 'that there are persons who think the Transactions bring me in a sufficient revenue; but I will make it out to any man that I never received more than 40*l.* a year upon this account (and that is little more than my house rent), and now by a new agreement I have been obliged to make, I shall not bring it to above 36*l.* a year at most. How strangely therefore I must needs shift for my subsistence, and with what distraction I must perform my tedious work, let any sober man judge.' The following year Dr. Ward, then bishop of Salisbury, suggested to the council of the Society the propriety of

making some allowance to their secretary, observing that for his own part he was ashamed that Oldenburg should have been permitted to devote so much time and pains to the business of the Society without any consideration. The result of the application does not appear. The Transactions published by Oldenburg extend from No. 1, dated March 6, 1664, to No. 136, dated June 25, 1677, the year preceding his death. In 1675 he was accused by Hooke of not having done justice to him on the subject of the invention of spiral springs for pocket-watches. The dispute which ensued was at length terminated by a declaration of the council, 'that the publisher of the Transactions had carried himself faithfully and honestly in the managing of the intelligence of the Royal Society, and had given no cause for such reflexions.'

Oldenburg married the daughter of the famous John Dury, with whom he received an estate in Kent valued at 60*l.* a year. His only child was Rupert, named after his godfather Prince Rupert. He died, according to most authorities, in 1678 (Thomson says September, 1677) at Charlton, between Greenwich and Woolwich, where his body was interred.

He is author of a few short papers upon medical and other subjects in the 'Philosophical Transactions,' and also of some 'twenty tracts, chiefly theological and political, in which he principally aimed at reconciling differences and promoting peace and unanimity.' (Hutton.) He published, under the name of 'Grubendol' (an anagrammatised form of his real name), English translations of—1, 'Prodromus to a dissertation by Nich. Steno, concerning solids naturally contained within solids,' 1671, 8vo.; 2, 'A genuine explication of the Book of Revelations, full of sundry new Christian Considerations;' 3, 'The Life of the Duchess of Mazarine,' from the French. It is also stated that he translated several of Mr. Boyle's works into Latin.

The letters of Oldenburg, dated in 1667, leave no doubt that during some part of that year he was confined to the tower upon political grounds.

OLDHAM, a parliamentary borough and manufacturing town in the parish of Oldham-cum-Prestwick, in the Middleton division of the hundred of Salford and county palatine of Lancaster. Its direct distance from London is 165 miles north-west; from Lancaster 43 miles south-east; and from Manchester six miles north-east. The town is situated on an eminence on the western bank of the Medlock and near the source of another stream called the Irk. The rapid rise of this town is mainly attributable to its being in the vicinity of extensive coal-mines, which give employment to a large portion of its population, and to the great increase of cotton manufactures since the middle of the last century. In 1760 it is said to have consisted of only sixty dwellings: in 1801 its population was 12,024, and in 1831 it was 32,381. The number of steam-engines employed in the manufacture of fustians, cotton, and woollen and silk goods, has been roughly estimated at eighty, which is probably under the truth. The making of hats is supposed to be carried on here upon a larger scale than in any other part of England, and it was in this particular branch of manufacture that Mr. Thomas Henshaw, the principal benefactor of the town, realised his great wealth. Fairs for the sale of cattle, horses, sheep, and pedlery are held by custom on the 2nd May, 8th July, and the first Wednesday after 12th October.

In 1827 an act of parliament (7th and 8th Geo. IV., c. 64) was obtained for improving the road between Oldham and Standedge and for effecting other improvements in the town itself. Since then a local police has been established, and gas and water works erected. About the same time the old church of St. Mary, some portions of which are believed to have been erected in the reign of King Stephen, was taken down, and upon its site was laid the foundation of a new one, which, Mr. Baines observes, was by mistake dedicated to St. Paul instead of St. Mary. The living is a perpetual curacy, in the diocese of Chester and patronage of the rector of Prestwick. Its annual net income is 191*l.* The parliamentary borough is co-extensive with the chapelry of Oldham, comprising the townships of Chadderton, Crompton, and Royton, in addition to the township of Oldham. Oldham was first constituted a borough by the Reform Act, and now returns two members. In 1832 the Sunday-schools within the chapelry were thirty-eight in number and afforded instruction to more than 8000 children of both sexes. What is called the free grammar-school was founded by James Assheton, or Ashton, in the year 1606, but the income appears to have never exceeded its present value, which is about 26*l.* It 1826 it afforded partial instruction to fourteen boys free of charge. A much more important foundation is that of Thomas Henshaw, above mentioned, who, in 1807, after making sundry bequests, the chief of which was an annuity of 300*l.* a year to his widow during life, directed that the sum of 20,000*l.* should be applied out of his estate in supporting a blind asylum to be afterwards established at Manchester, and that 40,000*l.*, together with the residue of his estate, should be appropriated to instituting and supporting a blue-coat school either at Manchester or Oldham, as the trustees might deem adviseable; but he further directed that no part of these sums should be expended in the purchase of ground or in the erection of buildings, not doubting that either public or private benevolence would supply both the one and the other. The testator died in 1810, and fifteen years elapsed before his confidence in the benevolence of others was shown to be well grounded. In the meantime a bill was filed in the Court of Chancery, praying that the bequests in favour of the Blue-Coat School and Blind Asylum might be declared void, and the widow and next of kin declared entitled to the residue of the estate. The prayer having been refused, the property was vested in the name of the accountant-general, and had in February, 1826, accumulated to 96,320*l.* 6*d.*, three per cent. consols, inclusive of 11,000*l.* stock for securing the annuity to the widow, &c., which stock at the death of the annuitants will go in augmentation of the funds of the school. The blind asylum has been recently opened at Manchester. [MANCHESTER, xiv., p. 374, wherein read 'Henshaw,' instead of 'Kershaw.'] The ground for the blue-coat school was given in 1825 by Messrs. Radcliffe and Jones, and is situated on the lower part of Oldham Edge. The cost of erecting the school was principally defrayed by a subscription among the inhabitants of Oldham amounting to between 5000*l.* and 6000*l.*, and the building itself was completed in 1833-4 under the direction of Mr. Lane. It is a handsome stone edifice of considerable length, ornamented with several pinnacles, and comprising among its numerous apartments a spacious lofty school-room, dining-rooms, and an elegant entrance-hall.

Since 1834 two other schools have been established at Oldham with the assistance of grants from the lords of the Treasury, made at the recommendation of the National and British and Foreign School Societies. One of these can accommodate 1200 and the other 500 children.

(*History of the County Palatine of Lancaster*, by Edward Baines, 4to., London, 1836, in 4 vols.; *Sixteenth Report of the Commissioners on Charities*, 1826-7, ix., p. 222; *Return of Grants for the Advancement of Education*, 1837-8, xxxviii., &c.)

OLDYS, WILLIAM, an industrious and accurate bibliographer, and a useful biographical writer, was born in the year 1687. He was the natural son of Dr. Oldys, chancellor of Lincoln and advocate of the Admiralty Court. His father left him some property, but he seems to have fallen into extravagant and intemperate habits, and soon dissipated it. He was for some time librarian to the earl of Oxford, and made the catalogue of that nobleman's collection of books and MSS. when it was prepared for sale by Osborne the bookseller. The Duke of Norfolk appointed him to the situation of Norroy king-at-arms. He died on the 15th of April, 1761, aged seventy-four. His dissolute habits continued through life, and he died poor.

He was the author of the following works:—'The British Librarian, exhibiting a compendious view of all unpublished and valuable Books in all Sciences, as well in MS. as in Print,' London, 1737, 8vo.: anonymous. This work, though long neglected, is now esteemed for its accuracy and usefulness. A 'Life of Sir Walter Raleigh,' prefixed to Raleigh's 'History of the World,' 1738, folio. A translation of Camden's 'Britannia,' 2 vols. 4to., has been ascribed to him, almost with certainty. 'The Harleian Miscellany, or a Collection of scarce, curious, and entertaining Pamphlets and Tracts,' London, 1753, 8 vols. 4to. He wrote in the 'Biographia Britannica' the lives distinguished by the signature G, among which are those of T. and E. Alleyn, Eugene Aram, Caxton, Sir Geo. Etherege, &c. Besides the above works, he published a few others on bibliographical and medical subjects; and several manuscript notes on subjects of bibliography, together with a copy of

Langbaine's Lives, filled with remarks, are preserved in the British Museum.

O'LEA EUROPÆA, differs from most trees, except the sweet bay (Laurus nobilis), some species of cornus, and a very few others, in yielding a fixed oil from the pericarp; the seed being the source of fixed oils in most plants. The oil which is expressed from the ripe fruit immediately after being collected is most esteemed, and called virgin oil, oleum provinciale. That which is most highly prized comes from Nice and Genoa. When the oil is extracted by a stronger pressure, or by the aid of heat, or after the olives, having been collected into heaps, have remained till a kind of fermentation has occurred, it is the common olive oil, the properties of which vary in proportion as the fermentation has been of long or short duration. An oil of still inferior quality is obtained, when the husk of the olive, after the former treatment, is boiled in water. This kind is employed solely for the preparation of soap.

Virgin oil is of a very pale yellow or yellowish-green colour, more limpid when fine than any other fixed oil; inodorous; when fresh, but emitting a very peculiar odour when old; taste purely oily but by age becoming slightly rancid. Common olive-oil is o. a deep greenish or brownish-yellow colour, and an odour and aste more or less subrancid. Its specific gravity is greater than the other.

Olive-oil, on account of its high price, is frequently adulterated with poppy or rape oil. The former may be easily detected, if present in the proportion of only one per cent., as it retards the solidification of the oil, when a mixture, consisting of nine parts of nitric and three parts of hyponitrous acid, is added to a hundred parts of the suspected oil. The presence of metals may be detected by sulphuretted hydrogen. For various means of applying these and other tests, see Thomson's *Organic Chemistry*, 'Vegetable Substances,' p. 435.)

Olive-oil is used in medicine as an emollient, and to form cerates and plasters. It is also used in the manufacture of soap. The finest kind is much employed with various articles of food, particularly in the countries where it is produced.

As this oil becomes viscid more slowly than any other vegetable oil, it is used, after being purified, by watch-makers.

OLEA'CEÆ, so named after the subject of the last article, are monopetalous Exogenous plants, with a superior 2-celled ovary, a subvalvate corolla, two stamens, and a fruit with pendulous albuminous seeds. In the artificial collocations of natural orders to be found in books, these plants are usually stationed next Jasminaceæ, with which they have been even combined. It is however probable that they have really as much affinity with some of the monopetalous dicarpous orders.



Olea Europæa.

1. A flower; 2, an ovary divided vertically; 3, a ripe fruit cut in half; 4, a stone divided longitudinally.

The species of the order best known in this country are, the Olive, or Olea Europæa, the Lilac, or Syringa vulgaris, the Evergreen Phillyrea of many forms, the Privet, or Ligustrum, and the Fringe-tree, or Chionanthus; all which correspond in habit and in sensible properties, which latter are very generally bitter and febrifugal. The bark of the Olive has been extensively used by the French instead of Cinchona, and the young fruits of the common lilac form an infusion scarcely inferior to gentian.

The most anomalous genus of the order is the Ash, which, in its most genuine form, has no petals, and in the division called Ornus has the petals present, but separate to the base. It is however, in all essential circumstances, the same in structure as the more regular genera; and its relation to the order has been ingeniously proved by the fact that the Olive and the Lilac will both live when grafted upon it. It is from the Ornus, or Flowering Ash, that the bitter-sweet purgative substance called manna is secreted.

OLEA'RIUS, ADAM, whose name was OELSCHLAGER, was born about the year 1600, in the country of Anhalt. He studied at Leipzig, and made considerable progress in mathematics and philology. Frederic, duke of Holstein Gottorp, having resolved to send an embassy to Russia for the purpose of opening a commercial intercourse through that country with Persia and India, appointed Crusius, a civilian, and Brugman, a merchant, as envoys, and named Olearius secretary to the embassy. The envoys left Holstein in October, 1633, and arrived at Moscow in August, 1634, where they were well received by the czar Michael Federowitz, who was related to Duke Frederic. The czar gave them permission to proceed to Persia by the Volga and the Caspian Sea, and encouraged them in their undertaking. They however returned to Gottorp in April, 1635, in order to make further preparations for the journey. In the month of October of the same year the embassy set off again, arrived at Moscow in March, 1636, and thence descended by various rivers to the Volga, and down that stream to Astrakhan, where they arrived in September. From Astrakhan they sailed into the Caspian Sea, but were wrecked off Derbent; and in December they pursued their journey by land, passing through Ardebil, Sultanieh, Casbin, and Koom. In August, 1637, they reached Ispahan, then the capital of the Persian kingdom. After spending several months at Ispahan, the two envoys, with Olearius, retraced their steps to Derbent, and thence by land to Astrakhan, passing through the desert of Lesghistan, and in January, 1639, they entered Moscow for the third time. On the following August they returned to Gottorp. In consequence of this mission the shah of Persia sent an envoy to the duke of Holstein. Olearius published a narrative of his journey, 'Muscowitische und Persische Reisebeschreibung,' fol., Schleswig, 1647, with plates. It was translated into French by Wicquefort, 4to., 1656, and both the original and the translation went through several editions. The work was also translated into Dutch, Utrecht, 1651; and into English, 'Voyages and Travels of the Ambassadors sent by Frederic, Duke of Holstein, to the Great Duke of Muscovy and the King of Persia; with John A. de Mandelslo's Travels from Persia into the East Indies:' translated by J. Davis, fol., London, 1662.

Olearius was a judicious observer and a conscientious but rather diffuse writer. His account of the state of Russia two centuries ago is extremely curious, as well as the information which he gives concerning Persia. He agrees with other modern travellers in describing the Persians as a very corrupt people, and as more debased than the Turks, though at the same time more refined in external behaviour. The then reigning sovereign of Persia, Saïn Mirza, called also Shah Sefi, grandson of Shah Abbas, he describes as a monster of cruelty and lust. Olearius also speaks very frankly of the conduct of some of the members of the embassy, especially the envoy Brugman, who behaved in a very improper and intemperate manner on several occasions. (b. iv.)

Olearius also published the narrative of Mandelslo's travels to India, which is annexed to the later editions of the travels of Olearius, as well as to the English translation above mentioned. Mandelslo was a young German nobleman who accompanied the embassy to Ispahan, from whence he proceed to India by Ormuz and Surat. From Surat he went to Agra, where he saw Sultan Kurram, called also Shah Jehan, the then sovereign of the Mogul empire. Returning to Surat, he embarked for Goa, where he remained some time: he then proceeded by sea to Ceylon, from whence he sailed again for Europe, where he arrived at the end of 1639. Besides describing the places which he

actually visited, Mandelslo communicated much information which he obtained at Ceylon concerning the Indo-Chinese countries, the empires of China and Japan, and the Philippines, the Moluccas, and Java.

Olearius, after his return, was made councillor and librarian to the duke of Holstein. He died in 1671. He wrote also a chronicle of Holstein, 4to., Schleswig, 1674.

OLEFIANT GAS. [HYDROGEN.]

OLE'GGIO. [NOVARA, Province.]

OLEIC ACID. Several processes have been proposed for the preparation of this acid, which is formed during the action of linseed and some other oils upon potash, and the formation of soap. To procure this acid a solution of the potash soap is to be mixed with a large quantity of water; by this supermargarate of potash is precipitated, and this is to be separated by the filter; the filtered liquor is to be concentrated by evaporation, and the free potash saturated with hydrochloric acid, and water again added precipitates a further portion of the supermargarate of potash: these operations are to be repeated as long as the pearly supermargarate is precipitated by water. After this the clear liquor is to be evaporated and decomposed by a slight excess of hydrochloric acid, which decomposes the oleate of potash, and separates the oleic acid.

The properties of oleic acid, when purified from margaric acid and a little colouring matter, are, that it is a colourless oil; its smell and taste are somewhat rancid; its specific gravity, at 65° Fahr. is 0·898. When cooled a few degrees below 32°, it concretes into a mass of needleform crystals. In vacuo it distils without alteration, but when in contact with air a portion suffers decomposition. It is insoluble in water, but mixes in all proportions with alcohol of specific gravity 0·822, and water precipitates it from the alcohol, which furnishes the best method of freeing it from colouring matter. It reddens litmus, and when heated decomposes the alkaline carbonates.

Oleic acid cannot however be obtained in a separate state, being always in combination with either water or base; 100 parts contain 3·8 of water. The anhydrous acid consists, according to the opinion and atomic numbers of Berzelius, of

70 atoms	. .	carbon	81·32
117 „	. .	hydrogen	11·09
5 „	. .	oxygen	7·59
			——100

It follows from what has been stated of the mode in which oleic acid is procured, that it enters largely into the composition of soaps, forming with potash soft soap, and with soda hard soap.

The *Oleates* in general are not crystallizable salts; and those which are not altogether insoluble are mucilaginous before drying; they are usually very fusible.

Oleate of Potash.—This salt has a bitter alkaline taste. When mixed with twice its weight of water, it swells and forms a transparent jelly; when this quantity of water is doubled, a syrupy liquor is obtained. A still larger quantity of water does not render it turbid, but after a considerable time a mucilaginous superoleate of potash separates. Alcohol dissolves its own weight of oleate of potash, when heated to 124° Fahr. and it solidifies on cooling; 100 parts of boiling æther dissolve 3·43 parts, and the solution remains fluid when cold. Bi-oleate of potash may also be formed; it is soluble in water and in alcohol both hot and cold, and the solution reddens litmus.

Oleate of Soda—Has a slight smell, and a slightly alkaline taste. Cold water dissolves 1-10th of its weight.

Oleate of Barytes is insipid, and insoluble in water. Boiling alcohol dissolves only a small quantity. It is soluble in oleic acid.

Oleate of Magnesia—Has the form of semi-translucent white grains, which soften between the fingers.

Oleate of Copper.—This salt is green. It melts when exposed to the heat of the sun.

Oleate of Lead.—The neutral oleate is prepared in the moist way. It melts between 144° and 153° Fahr. Alcohol and æther dissolve it slowly when cold and rapidly when hot, without altering its neutrality.

Superoleate of Lead.—This salt is liquid at 75° Fahr., and below this temperature becomes an adhesive mass. Boiling alcohol dissolves a little of it, and deposits a neutral salt on cooling. Oil of turpentine and oil of petroleum dissolve it and also the neutral oleate.

OLEIN, or ELAIN. It was first observed by Chevreul that expressed oils and different kinds of fat usually contain two oils of different degrees of fusibility, or in other words, two different fatty substances; so that on cooling any expressed oil, one part of it became solid, while another portion retained its fluidity. In consequence of this observation he concluded that all expressed oils are similarly constituted; to the less fusible oil he gave the name of *stearin* (from στέαρ, suet), and the more fusible he termed *elain* (from ἔλαιον, oil), which was afterwards changed to *olein.*

Several methods have been proposed for separating these two substances. When olive oil, for example, is exposed to a low temperature, a portion of it becomes solid, and the remainder retains its fluid form; the former is *stearin,* or *margarin,* and the latter *olein;* these are separated by absorbing the liquid part by blotting-paper, and pressing the solid portion between folds of this paper till it ceases to render it greasy. The olein which the paper has absorbed is then to be separated from it by boiling it in water, on which the olein floats, and the paper sinks.

Olein has scarcely any taste or smell when procured from oils which possess these properties only in a slight degree. Its specific gravity is 0·98, it solidifies at 27° Fahr., and crystallizes in needles. In water it is quite insoluble, but alcohol takes it up largely when boiling; by the alkalis potash and soda it is readily saponified, and during this operation oleic acid is formed by a new arrangement of the elements of the olein and their action on the elements of water; and these changes occur without the evolution of any gaseous matter.

On account of the very low temperature at which olein congeals, it is well adapted for lubricating the wheels of watches, and its value in this respect is enhanced by its not readily becoming rancid by the action of the air.

According to Saussure, the olein of olive oil consists of

Carbon	.	.	76·03
Hydrogen	.	.	11·54
Oxygen	.	.	12·07
			——99·64

OLEON is a product obtained by distilling oleic acid mixed with lime; the residue is carbonate of lime, while from the commencement of the operation a fluid substance is obtained, which deposits mere traces of solid matter. This liquid is not acid, but the difficulty of obtaining oleic acid in a pure state has hitherto prevented chemists from determining its exact relation to oleic acid, or accurately determining its composition.

OLE'RON, or OLORON, a town in France, capital of an arrondissement in the department of Basses Pyrénées. It is situated on the Gave d'Oléron, 520 miles from Paris by the road through Poitiers, Bordeaux, Bazas, and Pau.

Oléron is an antient town, and appears in the 'Itinerary' of Antoninus under the name of Iluro, and in the 'Notitia Provinciarum Galliæ' under that of Civitas Elloronensium. From the commencement of the sixth century a bishopric existed here, which was suppressed at the Revolution. In the middle ages the town was ruined by the Saracens and the Northmen, but restored by the care of the viscounts of Béarn. It consists now of three parts: the upper town (*ville haute*), and the lower town (*ville basse*), forming Oléron properly so called, chiefly between the Gave d'Aspe and the Gave d'Osson, or Ossau, which, by their junction, form the Gave d'Oléron; and Sainte Marie, a separate commune on the left bank of the Gave d'Aspe. A portion of the lower town is on the right bank of the Gave d'Osson. The population of the commune of Oléron, in 1831, was 6458 (of whom 5850 were in the town itself); that of Sainte Marie, 3371 (of whom 2718 were in the town): giving an aggregate of 9829. The population of Oléron alone, in 1836, was 6620. The upper town is the oldest part of Oléron, and consists of a few lanes, an antient church, and a little old market-house on the summit of a hill. The lower town, which contains the greater part of the population, is at the foot of the hill on which the upper town stands. The trade of the place is carried on here. Sainte Marie, united to Oléron by a lofty bridge, is the best laid out and best-built quarter of the whole town: it contains the former cathedral and episcopal palace.

The chief manufactures of the town are of paper, stockings, the woollen caps worn by the Béarnais peasantry, and box and horn combs for the Spaniards: the manufacture of coarse woollen cloths has much decayed. Considerable trade was formerly carried on in Spanish wool, but it is

now trifling. Wool from the surrounding country, sheepskins, cattle, horses, fir timber for masts of ships of war, are sold. Hams, called Bayonne hams, and salted geese, are prepared here and all over the department. There are two yearly fairs. There are some judicial or fiscal government offices in the town.

The arrondissement of Oléron comprehends an area of 712 square miles, and includes 81 communes. It is divided into eight cantons, or districts, each under a justice of the peace. The population, in 1831, was 74,552; in 1836 it was 76,312.

OLE'RON, ISLE OF. [CHARENTE INFERIEURE.]

OLE'RON, LAWS OF. The laws, or constitutions, or judgments of Oleron, are a capitulary of antient marine customs written in old French, and bearing the name of Oleron for several centuries, because tradition points to the island so called [CHARENTE INFERIEURE] as the place of their original promulgation. An antient copy of these laws is to be found in the 'Black Book' of the Admiralty, the original of which is supposed to be in the Bodleian Library; but they are not there called the Laws of Oleron, nor is there any reference in the laws themselves, or in the book which contains them, to their origin or history. They are not unfrequently appended to antient editions of the 'Coutumier' of Normandy under the title of 'Les Jugemens de la Mer:' in Cleirac's edition of the 'Uz et Coutumes de la Mer' they are given, without any description of the book or place from whence they are taken, under the name of 'Roole des Jugemens d'Oleron.' They are generally referred to by French writers on maritime law as 'Jugemens d'Oleron.' The copies of these laws however published by Cleirac, as well as those appended to the 'Coutumier de Normandie,' differ materially from each other, and also from that in the 'Black Book' of the Admiralty, though many of the articles are almost verbally the same in all. They relate to the rights and duties of ship-owners, mariners, maritime contracts, pilotage, port and custom laws, and losses at sea; but are chiefly remarkable at the present day from the circumstance that they were for several centuries adopted by all the nations of Europe as the foundation of their maritime laws.

It has been generally stated by English law writers that the laws of Oleron were compiled and published by Richard I. in the island of Oleron, on his return from the Holy Land. This statement, which is in substance given by Coke, Selden, Hale, Prynne, Blackstone, Reeve, and several English writers on maritime law, furnishes a curious instance of the readiness with which historical errors are propagated when one writer makes his assertions respecting facts from the statements of another without thought or examination. There is scarcely any fact in history more entirely settled, and few more notorious, than that Richard I., in returning from the Holy Land, was shipwrecked in the Adriatic, near Venice, and was immediately taken by Leopold, duke of Austria, and detained a prisoner in Germany (Rymer's *Fœdera*, vol. i., p. 70); and there is good evidence that at the expiration of his captivity he returned home through Flanders, without touching upon his French dominions. (Hoveden.) It is equally clear, from the account of Hoveden and other chroniclers, that on his way to the East he travelled by land through France, and embarked at Marseille for Sicily. There is therefore not the slightest foundation for the statement that these laws were made by Richard I. at the isle of Oleron on his return from the Holy Land. Indeed the only positive evidence that they were the work of Richard at all is found in what Sir Edward Coke calls a 'notable' record in the Tower (4 Inst., 144), which record is also mentioned by Selden in his 'Mare Clausum' (lib. ii., cap. 24). The part of this record however in which these laws are noticed is dated in the reign of Edward III., and consequently 150 years after Richard's time; and according to Mr. Luders's account of it, the document appears hardly to deserve the name of a record, being merely a roll, consisting of detached membranes, relating to maritime and mercantile affairs of different reigns, miscellaneously thrown together, and without any formal date or description, or anything to give them the authority of a judicial act. (Luders's *Inquiry into the Origin of the Laws of Oleron.*) This document contains the following passage, from which the false story, ascribing this piece of legislation to Richard I. has sprung:—'Quæ quidem leges et statuta per Dominum Ricardum quondam Regem Angliæ, in reditu suo de Terrâ Sanctâ, correcta fuerunt, interpretata, declarata, et in insulâ Oleron publicata, et nominata in Gallicâ linguâ La Ley Oleroun.' On the other hand, there are strong reasons for attributing to these ordinances a later date than the reign of Richard I., the principal of which are:—1, that they are written in the French language; whereas in the reign of Richard I. all laws of royal ordinance, both in the king's French dominions and in England, were written and promulgated in Latin; 2, that if they had been promulgated in England before the time of Bracton, Britton, and Fleta, they must have been mentioned by these authors; and 3, that the original historians of the reign of Richard I. (though sufficiently ready to record his merits) never mention this part of his legislation.

Mr. Luders conjectures, in the excellent tract above alluded to, that these laws did not proceed from any royal ordinance; but that the men of Oleron, who had corporate privileges granted to them by the name of 'Burgenses de Olerone,' in the reign of John (Rymer's *Fœdera*, vol. i., p. 111, 112), and had very considerable trade as early as the twelfth century, may have collected adjudged cases upon the laws of the sea, for regulating their own maritime affairs;—that hence the laws of Oleron derived their name; and being received and respected in England and France in the course of the fourteenth century, became known and partially adopted in other nations of Europe. To the copies of the laws appended to the 'Coutumier de Normandie,' and also to those given by Cleirac, in the 'Uz et Coutumes,' an attestation by the seal of the isle of Oleron is attached, with the date of 1266. This seal is inventoried as having been once in the treasury of the Court of Exchequer. See Palgrave's 'Kalendars and Inventories of the Exchequer,' vol. i., p. 106.

OLI'BANUM. This name, of frequent occurrence in comparatively modern works, does not appear to have been known to antient commerce or Materia Medica. It appears to have been derived from the Greek λίβανος, or the Arabic *looban*, which is applied, as well as the name *Koondur*, to the substance known in Europe by the name Olibanum. Avicenna describes a resinous substance under the name *Koondur*, to which, in the Latin translations, Olibanum is given as a synonyme, as well as *Thus*, and with this the Arabian author includes a description of the bark, manna, and smoke of Thus, or frankincense; in the same way as we find, in Dioscorides, the description of Libanos, or Thus, followed by that of the other parts we have mentioned, indicating, as is evident indeed from the description, that Avicenna, under *Koondur*, refers to the λίβανος of Dioscorides. Both authors mention an Indian kind of the substance. Mr. Colebrooke ascertained (*Asiatic Res.*, ix. and xi.) that *Koondur* was applied in India to a fragrant resin still used there as incense, and which he ascertained to be the produce of the tree which has been already described under the article BOSWELLIA *thurifera*. The name *Koondur* appears derived from the Sanscrit *Koondooroo*, which is applied to *looban* by the Hindus. (*Fl. Ind.*, ii., p. 384.) The tree is common in the mountains of Central India, as well as in those of the Coromandel coast, together with *B. glabra*, the other species of the genus, and which extends as far north as 30° in the Sewalik or sub-Himalayan range of hills.

Dr. Royle mentions that he has collected off the trunk of this species, in the latter locality, some very clear, pure, and fragrant resin, which burns rapidly away with a bright light, diffusing a pleasant odour. Both species yield this fragrant resin, which is employed as incense in India, and which might be much more extensively collected than at present. From the affinity in vegetation between parts of Arabia, Persia, and India, it is not improbable that the genus Boswellia may extend to Arabia, and there produce the kind known as *Arabian Olibanum*, the tree yielding which has not yet been traced out by botanists. But with respect to most of the Arabian exports, it is difficult to know whether they are the produce of that country, or have been first obtained by commerce and then re-exported, whence in early times Arabia obtained celebrity for producing so many of the fragrant and aromatic substances which we now know were obtained from Africa and India.

Dr. Royle further states that in Bengal the name *looban* is applied to Benzoin, though in Northern India applicable only to Koondur, the produce of *Boswellia thurifera*, and also that in Persian works, Benzoin is distinguished by

the names 'hussee-al-jawa' and 'hussee looban.' (*Illustr. Himal. Bot.*, pp. 177 and 261.)

OLIFANT'S RIVER. [CAPE OF GOOD HOPE.]

OLI'GODON, a name given by Boié to some small serpents belonging to the great genus *Coluber*, characterized by their blunt, short, and narrow head, and their want of palatine teeth.

OLI'VA is a considerable and well-built town, with 1500 inhabitants, situated in a beautiful country about a mile from the Baltic, in the government of Danzig. It was formerly a Cistercian abbey of great celebrity. The abbey church is a fine building and contains much that is worthy of the notice of travellers. There are 20 altars, of which the high altar is of black marble; one of the largest and finest organs in northern Europe, which was 37 years in building; and a considerable collection of valuable paintings. It was in this town that the memorable treaty of peace was concluded on the 3rd of May, 1660, which put an end to the war between Sweden, Poland, the emperor of Germany, and Brandenburg. John Casimir, king of Poland, gave up his pretentions to Sweden, and the republic ceded to Sweden, Northern Livonia, Esthonia, and the island of Œsel. Sweden renounced Courland, and both parties recognised the independence of Prussia. Hereupon Sweden, by the treaty of Copenhagen, 27th May, 1660, restored to Denmark, Drontheim and Bornholm; lastly it concluded in 1661 the convention of Kardes with Russia, on the basis of the 'Status quo ante Bellum.' Thus the peace of Oliva regulated the political relations of the north. This important event is recorded on a marble tablet which is preserved in the cathedral of Oliva. The prince bishop of Ermeland, who is the abbot, possesses, besides the abbey, a fine palace with an extensive park. One of the greatest ornaments of the town is the Karlsberg, an eminence rising 270 feet above the level of the sea, which commands a most magnificent panorama, embracing on one side the Baltic with the road of Danzig crowded with ships, on another the town of Oliva with the tower of the venerable abbey at the foot of the hill, on a third side the pleasing valley called the Schwabenthal, with many country-houses of the wealthy citizens of Danzig and the steeples of the city in the background, and to the north-west richly wooded hills and mountains. In the vicinity there are several steel, iron, and copper works.

(Müller's *Handbuch;* Böhme, *Acta Pacis Olivensis inedita*, 1763-1765, Breslau, 4to.)

OLI'VA. (Malacology.) [VOLUTA.]

OLIVA'REZ. Gaspar Guzman, Count Duke de Olivarez, was descended from one of the most illustrious families of Castile, which for three centuries had distinguished itself by courage, honour, and loyalty. Alfonso Perez de Guzman, the first of this name of whom mention is made, was the great captain of the thirteenth century, and his exploits against the Moors, as well as in the contest between the two princes of Spain, Don Juan and Don Sancho, have furnished some of the most interesting pages of the history of that period. The virtues and military abilities of this family elevated them to the highest dignities of the kingdom; and the Count Duke de Olivarez reckoned in his lineage, besides the noble house of Medina Sidonia, a long line of illustrious ancestors. But in him the virtues of the first Guzmans were completely lost, nor was he endowed with abilities equal to the times in which he lived, and to the duties of his exalted station.

The Count Duke de Olivarez was born at Rome, about 1587, where his father had been sent as ambassador of Philip III., and was educated in the university of Salamanca. On the termination of his studies, his uncle, the Duke of Uceda, introduced him to the prince of Asturias as gentleman of the bedchamber, and Olivarez now began to show that love of power which was the passion of his after-life. To gain the affections of him who was to be the ruler of the empire was a great step towards future aggrandizement, and in this he succeeded so completely, that when Philip IV., at the age of seventeen, ascended the throne of Spain, in 1621, Olivarez was intrusted with the management of the affairs of the kingdom. Policy induced him to abstain for a few months from assuming any definite public character, and this apparent disinterestedness endeared him still more to the young king, who, as a token of his increased esteem, conferred on the favourite the title of Duke de San Lucar.

Guzman now laid aside the mask of moderation, and displacing his benefactor the Duke of Uceda, and dismissing all the best servants of the people and the king, he assumed uncontrolled power. The consciousness that he was building his greatness on the ruin of others, made him so suspicious, that he saw an enemy in every individual whom the late minister had patronised. Actuated by this feeling, he surrounded himself with men who had scarcely any other claim to his confidence than attachment to his person, and he put them in places of the first responsibility; those who had hitherto occupied these places were dismissed, and often imprisoned. Ability and popularity in any individual were, to this jealous favourite, sure causes of alarm; and he who had the misfortune to possess either, was sure to give offence. These acts of injustice were however counterbalanced during the first period of the elevation of Olivarez by various useful regulations, in which he showed a wish to equalise the rights of the Spaniards and to promote the general prosperity of the country. Grants, both unmerited and profuse, which had been made by preceding kings, were recalled; marriage was encouraged by exemption from taxes; foreign artists and agriculturists were invited, by advantageous offers, to settle in Spain; about two-thirds of the idle officials were dismissed, and various sumptuary laws were enforced. Thus the revenue of the state was greatly increased, but the mass of the nation, the labouring part of the community, derived no benefit from these measures. Olivarez, while directing his attention to secondary means, neglected the vital principles on which depend the internal prosperity of a nation, the encouragement of agriculture, commerce, and the mechanical arts. These were suffered gradually to decline, an error which afterwards proved fatal to the popularity of the corrupt favourite; and the discontent excited by distress at home was increased by the constant failure of the minister's negociations abroad.

Cardinal Richelieu, then first minister of France, and the duke of Buckingham, the favourite and prime minister of Charles I., and particularly the former, possessed abilities which made them more than a match for the unprincipled Spanish minister. Independent of the personal dislike which Olivarez felt towards the cardinal, each of these statesmen entertained views which placed them in constant opposition. The aim of Olivarez was to raise the preponderance of the house of Austria; that of the cardinal, to depress both Austria and Spain. Buckingham sided with the French or Spanish favourite as it suited his interest. Thus though Spain exhausted her coffers in spreading her armies over Holland, Germany, and Italy, whatever advantages she obtained were rendered unavailing by the superior combinations of Richelieu. Olivarez was baffled in every attempt to regain the influence which Spain had once exercised all over Europe, and he brought the country to the verge of ruin.

The unpopularity of Olivarez, owing to these reverses and mistaken policy, had become general, when the insurrections of Catalonia and soon after that of Portugal took place, in 1640, in consequence of the minister's attempts to invade the rights of those states. These events, and more particularly his attempts to trample on the privileges of a proud nobility, in which he had only a selfish object in view, were a death-blow to the power of the minister. He still struggled for three years against his failing fortune, but was at length compelled to abandon the affairs of state. In 1643 he was requested by the king to resign, just at the moment when the death of Richelieu opened to him the prospect of success. Olivarez administered the affairs of Spain for the long period of twenty-two years, but more through the favour of the feeble king whom he governed than by his capacity, and his name has become historical not for the good which he did, but from the position which he occupied. Detested by the whole nation, he spent the short remainder of his life in obscurity. He died in 1643, shortly after his disgrace.

(Cespedes, *Hist. de Felipe IV.*) This writer is partial to Olivarez.

OLIVE OIL has already been mentioned as the produce of OLEA EUROPÆA. Olive oil, being so extensive an article of commerce, and the tree in consequence so important as to have been called by one author 'a mine upon earth,' requires separate mention. The olive flourishes only in warm and comparatively dry parts of the world, as the south of France and Spain, in Italy, Sicily, Syria, and the north of Africa. Humboldt has stated that 'the olive flourishes between the parallels of 36° and 44°; wherever

the mean annual temperature is from 62·6° to 58·1°, where the mean temperature of the coldest month is not below from 41° to 42·8°, and that of the whole summer from 71·6° to 73·4°.' Great cold is injurious to it, as that of 1709 was to the olive-trees of France; and as M. Bové states that the olive thrives in Egypt, and Delile that it contributes to the riches of the Fayoum, which is nearly in the latitute of Cairo, it is evident that it is capable of bearing a greater degree of heat, as is probable indeed from its being a native of Asia, having been cultivated in early times in Syria and Palestine by the antient Hebrews, and known to them by the name of *zait*, and to the Arabs by that of *zaitoon*. It is said to have been introduced by the Phocæans into Marseille.

Olive oil is largely produced in Spain, France, and Italy, though most extensively imported from the last-mentioned country into England. Thus, of 2,791,057 gallons of olive oil imported in 1830, 2,034,237 were from Italy; 639,468 from Spain, 52,004 from Malta, partly at second-hand, 21,467 from Turkey, 11,300 from the Ionian Islands, and about 30,000 at second-hand from the Netherlands and Germany. Provence and Languedoc are the provinces best suited in France to the production of olive-oil, and the finest quality is prepared in the neighbourhood of Aix. It is produced in Lucca and Florence, and exported from Leghorn; also in the kingdom of Naples, chiefly in Apulia and Calabria, and largely exported from Gallipoli, on the east coast of the Gulf of Tarento, whence it is commonly known by the name of Gallipoli oil. The duty levied is 8*l.* 8*s.* a tun (252 wine gallons), and amounts to about 20 per cent., or one-fifth, of the price.

Olive oil is the lightest of the fixed oils, and is largely used in the south of Europe as an article of diet, and likewise in cookery and for salads in the north. It is also used in many of the arts where fine oil is required, as to make the best kinds of soap, and in the woollen manufacture. In a very interesting paper in the volume, 'Vegetable Substances employed as Materials of Manufactures,' it is stated that Gallipoli oil is purified to the highest degree by merely keeping it in cisterns hollowed out of the rock on which the town is built. See also M'Culloch's *Com. Dict.*; and for the culture of the olive, the works of Bernard, Amoreux, and Rozier.

OLIVE-TREE. [Olea Europæa.]

OLIVELLA, Mr. Swainson's name for a genus, or rather subgenus, separated by him from *Oliva;* and characterized as having two plaits on the columella.

OLIVER, ISAAC, an English painter, was born in the year 1556. He studied first under Hilliard, and received further instruction from Frederick Zucchero. His chief employment was in painting the portraits in miniature of the most distinguished personages of his time, and many very fine portraits by him are preserved in the collections of the English nobility and gentry. Among them there are some portraits of himself, of Queen Elizabeth, Mary queen of Scots, Prince Henry, son of James I., Ben Jonson, and others, which are admirably finished, and fully justify the high reputation which he enjoyed. A whole-length portrait of Sir Philip Sydney is especially admired. It is no mean testimony to his merit that Rubens and Vandyck painted King James I. after a miniature by this master. He was a good and correct designer, his touch was neat and delicate, and his works are still as highly esteemed as they were by his contemporaries. Though he generally worked in miniature, he frequently painted on a larger size, and sometimes attempted historical subjects, in which there is much merit. He occasionally worked in oil as well as in water-colours, but with little success. His drawings, many of which are copies from Parmegiano, are beautifully finished and highly prized. In the apartment called Queen Caroline's Closet at Kensington Palace, there is a fine drawing by Oliver, the subject of which is the Entombment of our Saviour, and another from Raphael's Murder of the Innocents. He died in 1617, at the age of 61.

OLIVER, PETER, the son and disciple of Isaac, was born in 1601, and though so young at the time of his father's death, had so well profited by his instruction and example, that he attained a degree of perfection in miniature portrait painting indisputably superior to his father or to any of his contemporaries, especially as he did not confine his subjects to a head only. He likewise painted historical pictures, nineteen of which were in the collection of Charles I. and James II. Seven of these are still preserved in Queen Caroline's Closet at Kensington.

OLIVES, MOUNT OF. [Jerusalem.]

OLIVET, JOSEPH THOULIER D', was born at Salins, the 1st of April, 1682, of respectable parents. Having been admitted among the Jesuits, he was sent to their college at Reims in 1700, and afterwards to Dijon and Paris. At Paris he became acquainted with some of the most eminent literary men of the time, and took an active part in the controversy, which then existed in the French Academy, on the comparative merits of the antient and modern writers. He warmly supported the claims of the Latin and Greek writers to our attentive study, in opposition to the opinions of Fontenelle, La Mothe, and Perrault. Olivet left the society of the Jesuits about the year 1714, much to their regret, who offered him the place of instructor to the prince of Asturias to induce him to remain.

In 1723 Olivet was elected a member of the French Academy. He passed the remainder of his life at Paris, engaged in various literary works, and in occasional squabbles with his associates in the Academy. He died at the advanced age of 86, on the 8th of October, 1768. The personal character of Olivet appears, notwithstanding the attacks of some of his enemies, to have been without reproach. Among his numerous friends, who always spoke of him with the greatest respect, no one appears to have had a higher opinion of his talents and virtues than Voltaire, who was introduced by Olivet into the French Academy. (*Discours de M. de Voltaire à l'Académie Française,* Œuvres complètes, vol. 46.) Several letters of Voltaire to Olivet are extant.

The principal work of Olivet is his edition of Cicero, which was originally published at Paris in 1740-1742, in 9 volumes 4to. This edition, which is of little critical value, contains many useful notes, chiefly extracted from preceding commentators. It was reprinted at Geneva in 1758, in 9 volumes 4to., and very incorrectly at Oxford in 1783, in 10 volumes 4to. Olivet's translations of Cicero are some of the best that have been published, though, like most of the French translations, they are deficient in accuracy. Of these the principal are, the 'De Natura Deorum,' 1721, 1732, &c.; the 'Tusculanæ Quæstiones,' 1737, 1747, of which the third and fifth books are translated by Bouhier; the Orations against Catiline, together with the 'Philippics' of Demosthenes, 1727, 1736, &c. He also edited extracts from Cicero with a translation into French, under the title of 'Pensées de Cicéron,' which has been frequently reprinted and extensively used in the French schools. The only other work of Olivet worthy of notice is his continuation of Pélisson's 'History of the French Academy' (*Histoire de l'Académie Française*), published originally in 1749, in 2 vols. 4to., and reprinted in 1730, in 2 vols. 12mo.

OLIVIE'R, CLAUDE MATTHIEU, born at Marseille in 1701, became councillor to the parliament of Paris, and distinguished himself as a pleader. He was one of the founders of the University of Marseille. He wrote several works, the principal of which is the 'Histoire de Philippe Roi de Macédoine et Père d'Alexandre le Grand,' 2 vols. 12mo., Paris, 1740, published after the death of the author. He wrote also a dissertation on the 'Critias' of Plato, which is in the 'Mémoires de Desmolets;' two 'Mémoires sur les Secours donnés aux Romains par les Marseillais pendant la Seconde Guerre Punique et durant la Guerre contre les Gaulois;' a 'Parallel of Tibullus and Ovidius,' and other minor productions. Olivier died at Marseille in 1736.

OLIVIE'R, GUILLAUME ANTOINE, born near Frejus in 1756, studied medicine at Montpellier, where he took his doctor's degree at the age of seventeen. He afterwards applied himself especially to the study of natural history, and having settled at Paris, published several memoirs which made him known to persons in office. At the time of the Revolution, the Girondin minister Roland, having conceived the idea of sending a mission to Persia for commercial and political purposes, appointed Olivier, and Bruguières, another naturalist. They set off for Constantinople in April, 1793, but soon after the Girondins having been replaced by Robespierre and the terrorists, Olivier and his companion were left without resources to prosecute their journey. They however took courage, and with the assistance of the French consuls in the Levant, they visited Egypt, Syria, and other parts of the Ottoman empire, and then proceeded by Mosul and Bagdad to Persia, and arrived at Teheran in July, 1796. The ruler of Persia was then the eunuch Aga Mehemet Khan, a ferocious tyrant. His minister however received the French envoys with courtesy, but owing to the distracted state of

the country, nothing was effected towards the object of the mission. Olivier and his companion visited Kom, Ispahan, and other places, after which they retraced their steps to Bagdad in November, 1796. From Bagdad they returned to Syria, and thence by Cyprus and Asia Minor to Constantinople. They then repaired to Athens, and from thence to Patras and Corfu, where they embarked on board a French frigate for Ancona, at which place they arrived in September, 1798. After his return to France Olivier prepared a narrative of his travels, which were published in 3 vols. 4to., with an atlas, Paris, 1807. The style is plain and unassuming; the observations are generally sensible and correct, and the author has added a sketch of the history of Persia from the usurpation of Nadir Shah to the end of the eighteenth century, when Fetah Ali Khan took possession of the throne. There is also considerable information concerning Mesopotamia, the Koords, and Bagdad, as well as regarding the Greek islands.

Olivier continued his studies of natural history, and published the 'Histoire Naturelle des Coléoptères,' 6 vols. 4to., Paris, 1808; and also 'Dictionnaire de l'Histoire Naturelle des Insectes,' in which he was assisted by others, in 9 vols. 4to. He died at Lyon in 1814.

OLLMÜTZ is one of the six circles of the Austrian margravate of Moravia: it has an area of 1900 square miles, with a population of above 400,000 inhabitants.

Ollmütz, formerly the capital of the margravate, but now only the chief town of the circle, is a well-built and strongly fortified town, in 49° 33′ N. lat. and 17° 9′ E. long. It is situated between two arms of the river Marsh, by which it is nearly surrounded. The houses are substantial and lofty, but gloomy, and most of them are raised on square buttresses, with piazzas. Ollmütz has four gates, five suburbs, and several remarkable public buildings and institutions of various kinds. There are thirteen churches, including the cathedral, which is an antient venerable pile of building. A magnificent edifice, which was formerly a college of the Jesuits, is now converted into barracks. The University library is likewise a fine structure, formerly a seminary of the Jesuits; and its collection of books, which has been augmented by those of suppressed monasteries, consists of above 50,000 volumes. The town-hall is a handsome edifice, detached from any other building, with a tower 250 feet high, in which is a very remarkable and once celebrated clock, which however has long been out of repair. The palace of the archbishop is a very extensive building, magnificently fitted up, but the prelate generally resides at Kremsier. The University, founded in 1581, was transferred to Brünn in 1784, but re-established in 1827: it consists of four faculties, and has between 600 and 700 students. Among the public institutions are a gymnasium, an episcopal seminary, a school for military cadets, a great infirmary, lying-in-hospital and orphan asylum, and the central board for the management of the affairs of widows and orphans in all the Austrian hereditary dominions. The population is stated by Cannabich, in 1836, at 13,588, but the 'Conversations Lexicon,' 1836, makes it amount to 19,000. The town has considerable manufactories of woollen cloths, numerous tanneries, and a brisk trade, an important article of which is the sale of cattle from Russia and Moldavia. The bishopric of Ollmütz, which is very antient, was erected into an archbishopric in 1777, and is one of the richest benefices in Austria. In 1758 Ollmütz was besieged by Frederick II., but bravely defended by the garrison, assisted by the inhabitants, till Marshal Daun came to its relief. The empress Maria Theresa testified her satisfaction by conferring on the town various rewards and honours.

(Stein, *Geogr. Lexicon*; Hassel, *Handbuch*; Cannabich, *Geographie*; *Oesterreichische National Encyclopädie*.)

OLME'DO, a town in the kingdom of Leon in Spain, situated in 41° 18′ N. lat. and in 4° 37′ W. long. It is in the province of Valladolid, and within the bishopric of Avila, and is the chief town of the small *partido*, or district, which bears its name. It lies near the confines of the provinces of Segovia and Avila, and is 8 leagues from Valladolid, 3 from Medina del Campo, 11 from Segovia, and 22 from Madrid.

The town is situated on an eminence on the eastern side of an extensive plain, fertile in wheat, rye, barley, oats, wine, and fruits, and affording pasturage to large flocks of sheep, and a few horses and horned cattle. At the base of the hill flows the Eresma, and at the distance of a league to the west the plain is intersected by the Adaja, both tributaries of the Duero. Olmedo was formerly strongly fortified, and still preserves an enclosure of walls. The population, according to Miñano, was in 1826 about 2150. It contains six parish churches, seven convents (two of monks and five of nuns, all suppressed in 1835), two hospitals, a public granary, and a posting establishment. A brandy-distillery, a saw-mill, and two tile-works, are the only manufactories. Its annual contribution to the royal treasury is 32,000 reales, or about 340*l.*

Olmedo is celebrated in Spanish history as the seat of several cortes, and for two sanguinary battles fought in its neighbourhood, the first in 1445, in which Juan II. of Castile obtained a victory over the Aragonese; the second, fought in 1467, between Enrique IV. of Castile and the rebels headed by his brother the Infante Don Alonso.

(Miñano; Laborde; Mariana.)

OLNEY. [BUCKINGHAMSHIRE.]

OLONETZ is an extensive government of Great Russia, comprised between 60° 30′ and 66° 30′ N. lat. and 29° 40′ and 40° 20′ E. long. According to Schubert the area is 79,520* square miles, including the great lake Ladoga, and the population 350,800. It is bounded on the north and north-east by Archangel, on the south-east by Wologda, on the south by Novogorod, on the south-west by Petersburg, and on the west by Lake Ladoga and Finnland.

Face of the Country; Soil; Climate.—As this government extends to the polar circle, its northern half has entirely the character of the high northern latitudes, while the southern part has more of the character of the temperate zone. The Scandinavian mountains enter the country from the north-west, surround the two great lakes Ladoga and Onega, and run to the borders of Petersburg and Novogorod. This range is low and rocky, the highest summits scarcely rising more than from 300 to 420 feet above the general level, yet they are covered during a great part of the year with snow. The country at their base is in general low, wet, and swampy. The summits are clothed with thick forests of fir and other timber: the declivities are in some places open and susceptible of cultivation. Blocks of granite, some of them of enormous size, are scattered all over the mountains. The dry, open, and wooded parts contain under the greensward pure or clayey mould over clay mixed with boulders of the rocks of the country: in the morasses bog-iron ore abounds, with deep sand and clay. The surface may be said to be equally divided between mountains and forests, open tracts, morasses, and water.

This government contains 1998 lakes, and 858 rivers and rivulets. The two greatest lakes are Ladoga and Onega: of the former, only the larger portion is in this government, the remainder being in Petersburg and Archangel; but we have included, after Hassel, the whole area of 6100 square miles in the area of this government. Lake Onega is nearly in the centre of the government: its mean length is 130 miles, and the breadth from 70 to 80 miles. Like Lake Ladoga, it contains numerous islands, most of which are covered with forests. Among the largest of the other lakes are Sego, Wiga, Kemscha, Leckta, Wodlo, Latscha, Kounta, and Nuk. The principal rivers are the Svir, which runs from Lake Onega into Lake Ladoga, and though full of boulders, is navigable; the Olonka, the Ruskola, and the Janez, all which run into Lake Ladoga. The following rivers run into Lake Onega:—the Wytegra, the Wode, the Lisch, and the Suma, all flowing from lakes of the same names, and the Losocha. The most considerable river however is the Onega, which issues from Lake Lussa, near Lake Onega, and running through the government of Archangel, falls into the White Sea. In many of these rivers there are waterfalls, the most remarkable of which is that called Kiwatscha, in the river Suna. With the exception of the circle of Kem, the climate is pretty uniform: the spring is long and damp, with frequent night frosts; the summer short, with many foggy days, the vegetation being however very vigorous, on account of the length of the days: the autumn is bleak; the winter long and severe. In 1787 quicksilver froze in Wytegra. The corn, notwithstanding, ripens well; but unforeseen accidents sometimes destroy the entire harvest. The health of the inhabitants does not suffer by the cold.

Natural Productions.—Notwithstanding the cold and

* This estimate includes the circle of Kem, which some writers assign to Archangel, as is done in the article ARCHANGEL. Hassel, 1821, follows Georgi, who expressly states that Kem was taken from Archangel and added to Olonetz, by order of Alexander, in 1801. Horschelmann, 1835, gives Kem to Olonetz; Schnitler, 1835, and Cannabich, 1836, give it to Archangel. Without Kem, Olonetz is divided into seven circles.

severe winter and the short summer, agriculture is carried on in all the circles, even in that of Kem, which is between 64° and 66° 30′ N. lat. The inhabitants cannot however raise sufficient corn for their own consumption, and are obliged to import from other governments. Flax and hemp thrive, and are extensively cultivated. There is no fruit, but the want of it is in some measure compensated by the abundance of wild berries, such as cranberries, bilberries, &c. There are numerous small gardens, in which turnips, carrots, radishes, onions, and sometimes cucumbers and potatoes are cultivated. The government is well provided with timber; and the crown forests alone cover 8,956,795 dessatines. Except the oak and beech, almost all the forest trees common in Russia flourish here, except in the circle of Kem. The southern mountains, the islands in Lake Onega, and the circle of Karapel, are rich in forests, in which there are not only the finest larches, but pines fit for masts of 100 feet in length. The inhabitants in fact derive their chief means of subsistence from the forests, which supply them not only with fuel and timber for building their houses and boats, but likewise with rosin, turpentine, pitch, tar, charcoal, tanners'-bark, balks, planks, and laths for exportation.

The fur-bearing animals furnish a profitable article of commerce. The breeding of cattle is not carried on to any extent, because their maintenance in the long winter is too expensive. Almost every peasant however has a couple of horses, cows, sheep, swine, and some domestic fowls. The wild animals are bears, wolves, elks, gluttons, many greyish-red and a few black foxes, a great number of badgers, and wild reindeer. Seals are found in the two great lakes. Waterfowl of various kinds abound. The fisheries are very productive: great quantities of sturgeon and salmon are sent to St. Petersburg. The minerals are granite, serpentine in large masses and of excellent quality, porphyry of various colours, sandstone, quartz, lime, clay, slate, alabaster, talc in large tables, plaster of Paris, and marble, which is procured in great abundance, especially at Twidia, on the west side of Lake Onega. There is likewise a good deal of iron, which is partly smelted in six great furnaces, and partly by the inhabitants in small furnaces, and wrought into various articles for domestic use. One manufactory of copperas produces annually 36,000 lbs. Besides these metals and minerals, the province has copper and gold mines, but not sufficiently rich to defray the expenses of working them; there are also silver, lead, and sulphur. Salt is obtained from some springs, but not sufficient for the supply of the inhabitants.

Manufactures and Trade.—It may be presumed that in a country so far to the north, with a scanty population,* there can be few manufacturing establishments on a great scale. More might be done if the inhabitants did not prefer going to seek employment in the other provinces, particularly in harvest time. The articles exported are the natural productions of the government, cannon from a foundry belonging to the crown, cast-iron, and some tallow: by far the greater part of the exports goes to Petersburg, and the remainder to Archangel.

The great majority of the inhabitants are Russians: in the western part there are many Finns, some of whom have embraced the religion of the Russian-Greek Church, while a large portion are still Lutherans. There are a few nomade Laplanders in the circle of Kem.

Education.—Schnitler, in 1835, says: 'For public instruction Olonetz is under the university of St. Petersburg. In 1824 there were 10 schools, with 22 masters and 349 scholars, of whom 4 were girls; in 1832, 11 schools, with 31 masters and 402 scholars. We do not know the state of the ecclesiastical schools. There is not one bookseller in the whole government, and only one printing-office, which belongs to the crown.' There is no great town.

OLONETZ, the former capital, is situated in 61° 0′ 45″ N. lat. and 32° 50′ E. long., on the river Olonka. It is an open town, with 2800 inhabitants. There are three stone and five wooden churches. A good deal of fine thread is manufactured here, and a considerable trade is carried on, partly across Lake Ladoga with Petersburg, and partly at the two annual fairs. The first dockyard established by Peter the Great was at Onega, and ship-building is still carried on.

* According to Schubert (1835), only 5 inhabitants to an English square mile: it must however be remembered that the area of the two great lakes and of the numerous small ones is included.

PETROZAVODSK, the present capital, is situated in 61° 47′ N. lat. and 34° 24′ E. long., on a bay of Lake Onega, and was so named by the empress Catherine II. from many manufactories (zavod) erected by Peter the Great, but now in ruins. It is an ill-built uninteresting town, remarkable only for the great imperial cannon-foundry.

(Hassel, *Handbuch*; Stein, *Geogr. Lexicon*; Cannabich, *Geographie*; Schnitler, *La Russie, la Pologne, et la Finlande*, 1 vol. 8vo., Paris, 1835.)

OLONNE, LES SABLES D'. [VENDEE.]

OLYGY'RA, M. Say's name for a genus of operculated pulmoniferous gastropods, which, as well as *Ampullina* of M. de Blainville, M. Rang would refer to the genus *Helicina* of Lamarck. [HELICIDÆ, vol. xii., p. 109.]

OLYMPIAD. [ÆRA.]

OLYMPIAN GAMES, the chief of the four great national festivals of the Greeks, were celebrated at Olympia, a sacred spot on the banks of the Alpheus, near Elis, every fifth year. The exact interval at which it recurred was one of forty-nine and fifty lunar months alternately; so that it fell sometimes in the month of Apollonius (July), sometimes in the month of Parthenius (August). (Boeckh ad Pind. *Olymp.*, iii. 18, p. 138; Müller's *Dorians*, vol. i., p. 281, trans.) The period between two celebrations was called an Olympiad. It lasted five days.

The origin of this festival is concealed amidst the obscurity of the mythic period of Grecian history. Olympia was a sacred spot and had an oracle of Jupiter long before the institution of the games. The Eleans had various traditions which attributed the original foundation of the festival to gods and heroes at a period long before the Trojan War; and among these to the Idæan Hercules, to Pelops, and to Hercules the son of Alcmena. The Eleans further stated, that after the Ætolians had possessed themselves of Elis, their whole territory was consecrated to Jupiter; that the games were revived by their king Iphitus, in conjunction with Lycurgus, as a remedy for the disorders of Greece; and that Iphitus obtained the sanction of the Delphic oracle to the institution, and appointed a periodical sacred truce, to enable persons to attend the games from every part of Greece and to return to their homes in safety. This event was recorded on a disc, which was preserved by the Eleans, on which the names of Iphitus and Lycurgus were inscribed. (Plutarch, *Lycurg.*, 1; Pausan., v. 20, 21.) Other accounts mention Cleosthenes of Pisa as an associate of Iphitus and Lycurgus in the revival of the festival. 'All that can be safely inferred from this tradition, which has been embellished with a variety of legends, seems to be, that Sparta concurred with the two states most interested in the plan, and mainly contributed to procure the consent of the other Peloponnesians.' (Thirlwall's *History of Greece*, vol. i., p. 386.) The date of the revival of the festival by Iphitus is, according to Eratosthenes, 884 B.C.; according to Callimachus, 828 B.C. Mr. Clinton prefers the latter date. (*Fasti Hellenici*, vol. ii., p. 408, note h.) The Olympiads began to be reckoned from the year 776 B.C., in which Coroebus was victor in the foot-race. We have lists of the victors from that year, which always include the victors in the foot-race, and in later times those in the other games. (Pausan., v. 8. 3.)

This, like all the other public festivals, might be attended by all who were of the Hellenic race, though at first probably the northern Greeks and perhaps the Achæans of Peloponnesus were not admitted. Spectators came to Olympia not only from Greece itself, but also from the Grecian colonies in Europe, Asia, and Africa. Among them were solemn deputations sent to represent their respective states. Women however were forbidden to appear at Olympia, or even to cross the Alpheus, during the festival, under pain of death. But at a later period we find women taking part in the chariot-race, though it is doubtful whether they drove their own chariots. An exception was made to this law of exclusion in favour of the priestess of Ceres and certain virgins, who were permitted to be present at the games, and had a place assigned to them opposite the judges. The management of the festival was in the hands of the Eleans. Originally indeed Pisa, in which state Olympia lay, seems to have had an equal share in the administration; but in the fiftieth Olympiad the Eleans destroyed Pisa, and from that time they had the whole arrangement of the games. They proclaimed the sacred truce, first in their own territories, and then throughout the rest of Greece. This truce took effect from the time of its proclamation in Elis, and

while it lasted the Elean territory was inviolable, any armed invasion of it being esteemed an act of sacrilege. On this privilege the Eleans founded a claim to have their territory always considered sacred, though in fact they themselves did not abstain from war. As the presiding nation, they gave laws for the regulation of the festival, imposed penalties on individuals and states, and had the power of excluding from the games those who resisted their decrees. They actually thus excluded the Lacedæmonians on one occasion and the Athenians on another.

The Eleans appointed the judges of the contests, who were called Hellanodicæ. (Paus., v. 9. 4, 5.) They were instructed in the duties of their office for a period of ten months before the festival by Elean officers, called Nomophylaces (Paus., vi. 24. 3): they were sworn to act impartially, and an appeal might be made from their decision to the Elean senate. (Paus., vi. 24. 3.) Their number varied at different periods: in the 106th Olympiad it was fixed at ten, which was the number ever afterwards. The judges had under them officers, called ἀλύται, whose business was to keep order. These officers were called μαστιγόφοροι in the other Grecian games.

The Olympian festival consisted of religious ceremonies, athletic contests, and races. The chief deity who presided over it was Jupiter Olympius, whose temple at Olympia, containing the ivory and gold statue of the god by Phidias, was one of the most magnificent works of art in Greece. (Paus., v.) The worship of Apollo was associated with that of Jupiter (Müller's *Dorians*, vol. i., p.279-281, trans.); and the early traditions connect Hercules with the festival. (*Ibid.*, p. 453.) This is another proof of the Dorian origin of the games, for Apollo and Hercules were two of the principal deities of the Doric race. There were altars at Olympia to other gods, which were said to have been erected by Hercules, and at which the victors sacrificed. The most magnificent sacrifices and presents were offered to Jupiter Olympius by the competitors and by the different states of Greece.

The games consisted of horse and foot races, leaping, throwing, wrestling, and boxing, and combinations of these exercises. 1. The earliest of these games was the *foot-race* (δρόμος), which was the only one revived by Iphitus. The space run was the length of the stadium in which the games were held, namely, about 600 English feet. In the 14th Olympiad (724 B.C.) the δίαυλος was added, in which the stadium was traversed twice. The δόλιχος, which consisted of several lengths of the stadium (seven, twelve, or twenty-four, according to different authorities), was added in the 15th Olympiad (B.C. 720). A race in which the runners wore armour (ὁπλιτῶν δρόμος) was established in the 65th Olympiad, but soon after abolished. 2. *Wrestling* (πάλη) was introduced in the 18th Olympiad (B.C. 708). The wrestlers were matched in pairs by lot; when there was an odd number, the person who was left by the lot without an antagonist wrestled last of all with him who had conquered the others. He was called ἔφεδρος. The athlete who gave his antagonist three throws gained the victory. There was another kind of wrestling (ἀνακλινοπάλη), in which, if the combatant who fell could drag down his antagonist with him, the struggle was continued on the ground, and the one who succeeded in getting uppermost and holding the other down gained the victory. 3. In the same year was introduced the *pentathlon* (πένταθλον), or, as the Romans called it, *quinquertium*, which consisted of the five exercises enumerated in the following verse, which is ascribed to Simonides:—

Ἅλμα, ποδωκείην, δίσκον, ἄκοντα, πάλην,

that is, 'leaping, running, throwing the quoit, throwing the javelin, wrestling.' Others give a different enumeration of the exercises of the pentathlon. In leaping, they carried weights in their hands or on their shoulders: the object was to leap the greatest distance, without regard to height. The discus, or quoit, was a heavy weight of a circular or oval shape; neither this nor the javelin was aimed at a mark, but he who threw farthest was the victor. In order to gain a victory in the pentathlon, it was necessary to conquer in each of its five parts. 4. *Boxing* (πυγμή) was introduced in the 23rd Olympiad (B.C. 688). The boxers had their hands and arms covered with thongs of leather, called *cestus*, which served both to defend them and to annoy their antagonists. Virgil (*Æn.*, v. 405) describes the cestus as armed with lead and iron; but this is not known to have been the case among the Greeks. 5. The *pancratium* (παγκράτιον) consisted of boxing and wrestling combined. In this exercise and in the cestus the vanquished combatant acknowledged his defeat by some sign; and this is supposed to be the reason why Spartans were forbidden by the laws of Lycurgus to practise them, as it would have been esteemed a disgrace to his country that a Spartan should confess himself defeated. In these games the combatants fought naked. (Thuc., i. 6.)

The horse-races were of two kinds. 1. The *Chariot-race*, generally with four-horsed chariots (ἵππων τελείων δρόμος), was introduced in the 25th Olympiad (B.C. 680). The course (ἱππόδρομος) had two goals in the middle, at the distance probably of two stadia from each other. The chariots started from one of these goals, turned round the other, and returned along the other side of the hippodrome. This circuit was made twelve times. The great art of the charioteer consisted in turning as close as possible to the goals, but without running against them or against the other chariots. The places at the starting-post were assigned to the chariots by lot. There was another sort of race between chariots with two horses (δίωρις or σύνωρις). A race between chariots drawn by mules (ἀπήνη) was introduced in the 70th Olympiad, and abolished in the 84th. 2. There were two sorts of *races on horseback*, namely, the κέλης, in which each competitor rode one horse throughout the course, and the καλπή, in which, as the horse approached the goal, the rider leaped from his back, and keeping hold of the bridle, finished the course on foot.

In the 37th Olympiad (B.C. 632) racing on foot and wrestling between boys was introduced. There were also contests in poetry and music at the Olympian festival.

All persons were admitted to contend in the Olympic games who could prove that they were freemen, that they were of genuine Hellenic blood, and that their characters were free from infamy and immorality. So great was the importance attached to the second of these particulars, that the kings of Macedon were obliged to make out their Hellenic descent before they were allowed to contend. The equestrian contests were necessarily confined to the wealthy, who displayed in them great magnificence; but the athletic exercises were open to the poorest citizens. An example of this is mentioned by Pausanias (vi. 10. 1). In the equestrian games moreover there was no occasion for the owner of the chariot or horse to appear in person. Thus Alcibiades on one occasion sent seven chariots to the Olympic games, three of which obtained prizes. The combatants underwent a long and laborious training, the nature of which varied with the game in which they intended to engage. Ten months before the festival they were obliged to appear at Elis to enter their names as competitors, stating the prize for which they meant to contend. This interval of ten months was spent in preparatory exercises; and for a part of it, the last thirty days at least, they were thus engaged in the gymnasium at Elis. When the festival arrived, their names were proclaimed in the stadium, and after proving that they were not disqualified from taking part in the games, they were led to the altar of Jupiter the guardian of oaths (Ζεὺς ὅρκιος), where they swore that they had gone through all the preparatory exercises required by the laws, and that they would not be guilty of any fraud, nor of any attempt to interfere with the fair course of the games. Any one detected in bribing his adversary to yield him the victory was heavily fined. After they had taken the oath, their relations and countrymen accompanied them into the stadium, exhorting them to acquit themselves nobly.

The prizes in the Olympian games were at first of some intrinsic value, like those given in the games described by Homer. But after the 7th Olympiad, the only prize given was a garland of wild olive, cut from a tree in the sacred grove at Olympia, which was said to have been brought by Hercules from the land of the Hyperboreans. Palm leaves were at the same time placed in the hands of the victors, and their names, together with the game in which they had conquered, were proclaimed by a herald. A victory at Olympia, besides being the highest honour which a Greek could obtain, conferred so much glory on the state to which he belonged, that successful candidates were frequently solicited to allow themselves to be proclaimed citizens of states to which they did not belong. Fresh honours awaited the victor on his return home. He entered his native city in triumph, through a breach made in the wall for his reception; banquets were given to him by his friends, at which

odes were sung in honour of his victory; and his statue was often erected, at his own expense or that of his fellow-citizens, in the Altis, as the ground at Olympia which was consecrated to the games was called. At Athens, according to a law of Solon, the Olympic victor was rewarded with a prize of 500 drachmas: at Sparta the foremost place in battle was assigned to him. Three instances are on record in which altars were built and sacrifices offered to conquerors in the Olympic games.

It seems to be generally admitted that the chief object of this festival was to form a bond of union for the Grecian states. Besides this, the great importance which such an institution gave to the exercises of the body must have had an immense influence in forming the national character. Regarded as a bond of union, the Olympian festival seems to have had but little success in promoting kindly feelings between the Grecian states, and perhaps the rivalry of the contest may have tended to exasperate existing quarrels; but it undoubtedly furnished a striking exhibition of the nationality of the Greeks, of the distinction between them and other races. Perhaps the contingent effects of the ceremony were after all the most important. During its celebration, Olympia was a centre for the commerce of all Greece, for the free interchange of opinions, and for the publication of knowledge. The concourse of people from all Greece afforded a fit audience for literary productions, and gave a motive for the composition of works worthy to be laid before them. Poetry and statuary received an impulse from the demand made upon them to aid in perpetuating the victor's fame. [PINDAR.]

But the most important and most difficult question connected with the subject is whether their influence on the national character was good or evil. The exercises of the body, on which these games conferred the greatest honour, have been condemned by some philosophers as tending to unfit men for the active duties of a citizen (Arist., *Pol.*, vii. 14, 18; Athen., x., p. 413); while they are regarded by others as a most necessary part of a manly education, and as the chief cause of the bodily vigour and mental energy which marked the character of the Hellenic race.

The above description of the Olympian games will serve also for the most part for the other three great festivals of Greece. The chief points of difference between them will be seen by referring to the articles ISTHMIAN GAMES, NEMEAN GAMES, and PYTHIAN GAMES.

(Pausanias, v., vi., &c.; West's Pindar, *Preliminary Dissertation*; Wachsmuth's *Hellenische Alterthumskunde*, Th. i., p. 108; Potter's *Grecian Antiquities*, vol. i., p. 495; Thirlwall's *History of Greece*, vol. i., p. 384.)

OLY'MPIAS. [PHILIP OF MACEDON.]

OLYMPIODO'RUS. There were several Greek writers of this name.

OLYMPIODORUS of Thebes in Egypt continued the chronicle of Eunapius to A.D. 425. Of the twenty-two books of his history (Ἱστορικοὶ λόγοι), which he entitled 'Materials for History,' only a fragment is preserved in the Myriobiblon of Photius (80). His history began with the seventh consulship of the emperor Honorius, and was brought down to the accession of Valentinian. The work was dedicated to the younger Theodosius. The historian appears to have been employed on public business, for he mentions being sent on a mission to Donatus, king of the Huns. In his description of the African oases he speaks of wells being made to the depth of 200, 300, and even 500 cubits, and of the water rising up and flowing from the aperture. Some have supposed that these must have been Artesian wells. [ARTESIAN WELLS, p. 414.] Olympiodorus was a heathen.

OLYMPIODORUS of Alexandria, who is said to have lived in the latter part of the sixth century A.D., was a Peripatetic, and wrote a commentary on the 'Meteorologica' of Aristotle, which was printed by Aldus, Venice, 1551, fol. He is sometimes called the Younger, to distinguish him from the Peripatetic philosopher of the same name who was the master of Proclus, but who is not known to us by any extant work.

OLYMPIODORUS, a Platonic philosopher, and also a native of Alexandria, lived probably in the latter part of the sixth century A.D. There are extant by him commentaries on the 'First Alcibiades,' 'The Phædon,' 'The Gorgias,' and 'Philebus' of Plato. The first-mentioned of these commentaries contains a life of Plato. His commentary on the 'Gorgias' was published by Routh, in his edition of the 'Gorgias' and 'Euthydemus,' Oxford, 1784; that on the 'Phædon,' by Andreas Mustoxydes and Demetrius Schinas, in the συλλογῇ ἀποσπασματίων ἀνεκδότων, Ven., 1817; that on the 'Philebus,' by Stallbaum, in his edition of the 'Philebus;' and that on the First Alcibiades, by Creutzer, in the 2nd and 3rd volumes of the 'Initia Philosoph. ac Theolog. ex Platonicis Fontibus,' Frankf., 1826.

OLYMPUS. [ANATOLIA; CRETE; THESSALY.]

OLYNTHUS, a town in Macedonia, at the head of the Toronaic Gulf, was probably founded by the Chalcidians and Eretrians of Eubœa. (Strabo, x., p. 447.) It was sixty stadia from Potidæa, and was visible from the latter place. (Thuc., i. 63.) At the time of the invasion of Greece by Xerxes, Olynthus was in the hands of the Bottiæi, who had removed thither from Bottiæis on the Thermaic Gulf, but Artabazus, who was conducting Xerxes to the Hellespont after the defeat at Salamis, suspecting the fidelity of the Bottiæi, took the town from them and gave it to the Chalcidians. (Herod., viii. 127.) Olynthus, together with the other Greek towns on the coast of Macedonia, afterwards fell under the dominion of the Athenians; but it revolted from them at the beginning of the Peloponnesian war, and asserted its independence, which was completely secured by the conquests of Brasidas. From this time Olynthus became the most important of the Chalcidian towns, and the head of a powerful league, which was formed by admitting the citizens of the neighbouring towns to the enjoyment of the same civil and political rights as the Olynthians themselves possessed. Many of the principal towns of Macedonia, and among others Pella, joined this league; which soon became sufficiently formidable to excite the jealousy of the Lacedæmonians. They therefore gladly availed themselves of an opportunity which occurred for declaring war against Olynthus. The towns of Apollonia and Acanthus had been invited by the Olynthians to join the confederacy, with a threat of war in case they refused. Being unwilling to comply with the demands of the Olynthians, and unable to defend themselves, they applied to the Lacedæmonians for assistance, who sent an army of 10,000 men, under the command of Telentias, the brother of Agesilaus, B.C. 382. Telentias obtained some slight advantages at first, but in the spring of the following year (B.C. 381) his army was completely defeated, and he himself was killed in the battle. (Xen., *Hellen.*, v. 2, § 11-43; iii., § 1-6.) Telentias was succeeded in the command by Agesipolis, one of the kings of Sparta, who died however soon afterwards; and the conduct of the war accordingly devolved upon his successor Polybiades, who defeated the Olynthians and compelled them to sue for peace, which was granted (B.C. 379) on the condition that the Olynthians should acknowledge their dependence upon the Lacedæmonians, and assist them in all their wars. (Xen., *Hellen.*, v. 3, § 26.) We accordingly read of the Olynthian cavalry serving in the Lacedæmonian army against the Thebans. (Xen., *Hellen.*, v. 4, § 54.)

After the Spartan supremacy had been destroyed by the conquests of Epaminondas, the Olynthians again recovered their independence, and restored their confederacy. Their growing power however excited the jealousy of Philip, who entered into an alliance with the Athenians with the view of making war upon Olynthus. He took Potidæa and Torone, two of the most powerful of the confederate cities; but he made peace with the Olynthians after his quarrel with the Athenians.

In B.C. 349 the Olynthians broke off their alliance with Philip, and sent to Athens for assistance. The Athenians, by the advice of Demosthenes, who advocated the cause of the Olynthians in his three Olynthiac Orations [DEMOSTHENES], sent troops to their aid, under the command successively of Chares and Charidemus; but the Olynthians were nevertheless defeated, and obliged to surrender their town, which was destroyed by Philip, B.C. 347. (Diod., xvi. 53.)

Mecyberna was the harbour of the Olynthians. (Strabo, vii., p. 330; compare Herod., vii. 122.) It appears to have been in the possession of the Athenians during the early years of the Peloponnesian war, and was not recovered by the Olynthians till B.C. 421. (Thuc., v. 39.)




Coin of Olynthus.
British Museum. Actual Size.

OMALAXIS, a name given by M. Deshayes to a form among the *Trochidæ*, closely allied to *Solarium*, if not identical with it, and afterwards changed by the same author to *Bifrontia*. [TROCHIDÆ.]

OMAN. [ARABIA.]

OMAR I. (Abú Hafsah Ibn-al-Khattáb), successor of Abú Bekr, and second khalif of the Mussulmans, was the third cousin of Abdullah, the father of the prophet. The sworn enemy at first of Mohammed, whose life he attempted, and whose doctrines he opposed, he was converted to Islám in a manner apparently miraculous, and became one of Mohammed's most zealous and ardent followers; he accompanied him in all his military expeditions, and contributed by his experience and abilities to the success of his cause. [MOHAMMED.]

After the death of Abú Bekr (A.D. 634), whose *hájeb*, or chamberlain, he was, Omar was sworn khalif according to the express wish of his predecessor. The first act of his administration was to remove from the command of the Syrian armies the celebrated Khâled Ibn Walid, surnamed 'The sword of God,' who by his rapacity and cruelty towards the vanquished had made himself obnoxious. Omar replaced him by Abú Obeydah Ibn-al-Jerráh, another brave general who had distinguished himself in the wars against the Greeks; but Khâled had virtue enough to accept the second post in the army, and he continued to serve under the new general. These two commanders prosecuted the conquest of Syria, and took Damascus, its capital, in the month of Rejeb, A.H. 14 (August-September, A.D. 635).

After the capture of Damascus, the Moslems proceeded to the reduction of Emesa, Hamah, and Kennesrin. The emperor Heraclius sent a considerable force to stop the progress of the Arabs, but the Greeks were completely defeated at the bloody battle of Yermúk (636). The following year (637) Omar sent Amru Ibn-al-Ass and Sarjil to besiege Jerusalem. The city was stoutly defended by the garrison, but after a siege of several months the patriarch Sophronius, who commanded in it, agreed to surrender to the Moslems, but refused to treat with any other except the khalif himself. A messenger having been despatched to Omar, who was then residing at Medina, he hastened to Jerusalem followed by a scanty suite. Omar's journey from Arabia to Palestine has thus been described by the historian Tabari. 'He rode a sorrel-coloured camel, and was dressed in an old tattered habit of hair-cloth; he carried with him, in two bags, his provisions, consisting of dry fruits, barley, rice, and boiled corn, besides a skin for the water. Whenever he halted to make a repast, he permitted those who accompanied him to partake of it, eating from the same wooden dish: if he took any rest, the earth was his couch. During his march he administered justice to all applicants; in several instances he corrected the laxity of morals, and reformed several abuses, especially among the new converts; abolishing also many luxurious indulgences which had spread among the Moslems, such as the drinking of wine, the using of silken garments, &c. . . . Arrived at the camp, he caused several Moslems to be seized and dragged through the mud for having, in disobedience to his orders, arrayed themselves in the silken tunics of the conquered Greeks.' After a short conference with Sophronius, the terms of a capitulation were agreed upon, and the keys of the holy city were delivered up to Omar. The articles of the capitulation of Jerusalem have already been translated (*Mines de l'Orient*, vol. ii.), but as they were the model upon which the Moslems dictated many others to the subdued cities of Africa and Spain, we shall transcribe them here. 'The inhabitants shall retain their lives and property; they shall preserve the use of their churches, but they shall build no new ones; they shall neither place crosses upon those which they already have, nor hinder the Moslems from entering them night or day; they shall not ring their bells, but they shall be allowed to toll them; if a Moslem travels through the city, the inhabitants shall give him hospitality for three days. They shall not be enforced to teach their children the Korán, but they shall not try to convert any Moslem to their religion; they shall in every instance show respect for the Moslems, and give them the precedence; they shall wear turbans and shoes, and use names different from theirs. They shall be allowed to ride on horseback, but without either saddle or arms; they shall never go out without their girdles;* they shall not sell wine to the Moslems, and shall remain faithful to the khalif, and pay regularly the taxes imposed upon them.' Omar made his triumphant entry into Jerusalem towards the middle of the year 16 of the Hejira (A.D. 637). After conversing for awhile with Sophronius, and addressing to him several questions on the antiquities of the place, visiting the Church of the Resurrection, and saying his prayers under its portico, he desired to be conveyed to Bethlehem, where he also performed his devotions. Returning again to the city, he caused a magnificent mosque to be erected on the site of Solomon's temple, the same which still remains an object of great veneration to the Mussulmans. The taking of Jerusalem was followed by the reduction of all the principal cities of Palestine, while Khâled and Abú Obeydah made themselves masters of Laodicea, Antiochia, Aleppo, and Balbek.

Being master of Syria, Omar prepared to invade Persia, a kingdom then ruled by a king named Yezdejerd, against which he had at the beginning of his reign unsuccessfully contended (634). Saad Ibn Abí Wakkás, who was now entrusted with the command of the army, penetrated far into Persia, defeated at Kádesiyyah a powerful army commanded by Rustam, who fell in the battle, took possession of Bahr-Shír, in the western quarter of the city of Madáyin, the antient Ctesiphon, founded the city of Kúfah near the Euphrates (638), crossed the Tigris, and at last took Madáyin, the capital of Yezdejerd's kingdom.

In the meanwhile Amru Ibn-al-Ass, who commanded the armies of Egypt, completed the conquest of that country by the reduction of Alexandria (640). It was then that the famous library founded by Ptolemy Philadelphus is said to have been destroyed by the conquerors. Upon an application from Amru to the khalif to know his pleasure concerning its contents, an answer was returned, commanding its destruction, 'for,' said Omar, 'if the books of the Greeks agree with the book of God (Korán), they are superfluous, and need not be preserved; and if they disagree, they are pernicious, and ought to be destroyed.' In consequence of this decision, we are told, and (notwithstanding all Gibbon's ingenuity to discredit the account) we are inclined to believe, that the manuscripts were delivered up to the four (others say five) thousand public baths in the city, to which they served as precious fuel for six months. [ALEXANDRIAN LIBRARY.]

The conquest of Egypt was followed by that of part of Africa. Amru pushed his victorious arms as far as the deserts of Tripoli and Barca. Armenia was in the meanwhile subdued by Mughoyrah (641), and Khorassán (642) by Ahnaf Ibn Kays, another of Omar's lieutenants. In the same year was fought the famous battle of Nehavend, which decided the fate of Persia. Firúz, who now commanded the armies of Yezdejerd, was killed, and the monarch himself obliged to seek an asylum at Farghanah among the Turks, where he died soon after in poverty.

The success which attended the arms of Omar, his unflinching severity towards the vanquished who would not embrace the religion of the prophet, and, more than all, the inexorable justice which he dealt among his own people, excited against him numerous enemies at home and abroad, and several attempts were made upon his life. Iabalah Ibn Ahyám, chief of the Arabian tribe of Ghosán, became one of his most implacable enemies. Although a tributary to the Greek emperor, in whose states he lived with his tribe, and though professing the Christian religion, Iabalah went to see Omar at Medina, swore obedience to him, and embraced Islám with all his followers. Omar then took him with him on a pilgrimage to Mecca. While the neophyte was making as usual seven times the circuit of the Kaabah, an Arab of low extraction happened to run against him, and was the cause of the prince's cloak falling off his shoulders. Iabalah resented the incivility by immediately striking the man a blow on the face. The man made his complaint to Omar, who, having summoned Iabalah to his presence, sentenced him to receive a similar blow from the complainant. Against this sentence, just as it was, Iabalah most warmly remonstrated, saying that he was a king among his own people, and that the offender deserved to be punished with death. 'My friend,' said Omar to him, 'the religion that thou and I follow makes no distinction between the king and the subject.' Rather than submit to the sentence, Iabalah secretly left Mecca with all his suite, abjured Islám, and sought the protection of the Greek emperor. He had moreover sworn to revenge the outrage.

* The girdle was distinctive of all Christians then living under the Mohammedan sway.

Having communicated his plans to a resolute young slave of his, Wáthek Ibn Musáfer by name, he promised him his liberty, if he should succeed in killing Omar. Having arrived at Medina (638), where the khalif was then residing, Wáthek was informed that Omar was in the habit of sitting down every day under a tree on his way to the mosque. Wáthek, having climbed up the tree, awaited the arrival of Omar, who took his seat beneath it and fell asleep. Wáthek was upon the point of coming down for the purpose of stabbing Omar with his dagger, when, lifting up his eyes, he saw a lion walking round him and licking his feet. Nor did the lion cease to guard the khalif until he awoke, when the lion instantly went away. Wáthek was so much struck by this circumstance, that he came down, kissed the khalif's hand, confessed his intended crime, and embraced the Mohammedan religion.

The life of Omar however was at length ended by assassination. A Persian slave of the Magian sect, whose name was Abú Lúlú Firúz, had been obliged by his master Al-mugheyrah Ibn As-shaabah to pay him two dirhems daily, in conformity with the Mohammedan custom, for the free exercise of his religion. Firúz, resenting this treatment, brought a complaint before the khalif, and requested that some part at least of the tribute exacted of him might be remitted; but this favour being refused by Omar, the Persian swore his destruction, and some days afterwards, while Omar was performing his morning devotions in the mosque at Medina, he stabbed him thrice in the belly with a sharp dagger. The people fell upon the assassin, but he made so desperate a defence, that although he was armed with no other weapon than his dagger, he wounded thirteen of the assailants, and seven of them mortally. At last one of the khalif's attendants threw his cloak over his head and seized him; upon which he stabbed himself, and soon after expired.

Omar languished five days. He died on a Friday, in the month of Dhu-l-hajjah, A.H. 23, answering to the month of November, A.D. 644. He was buried on the following Saturday, close to the prophet and Abú Bekr, in a mosque which he had founded at Medina, where his tomb is still visited with great respect by the Mussulmans. Having been asked, some time before his death, to name his successor, he refused; and upon the suggestion of one of his courtiers that he should leave the khalifate to his son Abdullah, he remarked, 'It is enough that one out of my family has been forced to bear this burden, and account afterwards to his God for the command and government of the faithful.'

Omar was sixty-three years old when he died. Authors are at variance as to the duration of his khalifate: the best-informed historians however say that he reigned between ten and eleven years. Abú-l-fedá (*An. Mosl.*, tom. i., p. 251) says ten years, six months, and eight days. Omar was tall; he had a clear complexion; his head was bald. Mohammedanism cannot boast of a more virtuous sovereign or a more zealous apostle. It has been said of him that he contributed more efficaciously to the advancement of the Mohammedan religion than the prophet himself. Khondemir, the celebrated Persian historian, thus recapitulates the praiseworthy acts of this khalif:—'He took from the infidels 36,000 cities or castles, destroyed 4000 temples or churches, and founded or endowed 1400 mosques.' The prophet had the greatest esteem for Omar, whose daughter Hafssah he married. On a certain occasion he was heard to say, 'If God had wished to send a second messenger to this world, his choice would undoubtedly have fallen on Omar.' The devotion, humility, and abstinence of this khalif have become proverbial among the Mussulmans. He never tasted any other food than barley-bread and dates; water was his only drink; and he was often found asleep under the porch of a mosque or beneath a tree. He complied most strictly with all the precepts of the Korán. Eutychius tells us that during his khalifate he performed nine times the pilgrimage to Mecca. In order better to conform to the regulations of the Korán, he lived by the work of his hands, supporting himself entirely by the sale of leather belts which he manufactured. But the quality for which Omar was most conspicuous was justice, which he is said to have administered with an even hand to infidels as well as believers. The historian Wákedí says that the staff of Omar was more dreaded than the sword of his successors. In the lifetime of Mohammed, a Moslem, condemned for his iniquitous treatment of a Jew, happening to appeal to Omar from the sentence of the prophet, he immediately cut him down with his scymitar for not acquiescing in the sentence of so upright a judge. From this circumstance Mohammed gave Omar the surname of Al-farúk, which he retained ever afterwards, a word meaning the divider, or the discriminator, thus doubly alluding to his action and the discernment which prompted it. Several of the best Mohammedan institutions date from the reign of Omar. It was in his time that the æra of the Hejira, or flight of Mohammed, by which all Mohammedan nations compute their years, was established, and its beginning fixed on the 16th day of July, A.D. 622. He was the first who kept armies under pay, and assigned pensions to officers out of the public revenue: he instituted a sort of police force to watch at night for the security of the citizens; and he promulgated some excellent regulations respecting the duties of masters towards their slaves. He was also the first who assumed the title of Amír-al-múmenín (commander of the faithful) instead of that of Khalífah-rasúli-llahi (vicar of the messenger of God), which his predecessor Abú Bekr had used. Omar's memory is an object of the greatest veneration among Mussulmans of the Sunni, or orthodox sect; not so among the Shiites, or partisans of Ali, who look upon the three first khalifs, Abú Bekr, Omar, and Othmán, as usurpers of the khalifate, to the prejudice of Ali, to whom, they pretend, it belonged as the nearest relative of the prophet.

(Abú-l-fedá, *Annales Moslemici*, translated by Reiske, Hafniæ, 1790, tom. i., fol. 250, et seq.; Al-makín, *Historia Saracenica*, apud Erpenium, Ludg. Batav., 1625, p. 20, et seq.; *Raudhatu-l-manádhir*, by Ibn Shihnah, MS.; *The History of the Saracens*, by Simon Ockley, p. 300; Ibn-al-Khattíb, *Historia Calipharum*, apud Casiri; *Bib. Ar. Hisp. Esc.*, vol. ii., p. 177, et seq.; D'Herbelot, *Bib.Or.*, in voc. *Omar Ben al-Khattab, Khaled, Damashk, Iskandriah*, et alibi; Gibbon, *Decline and Fall*, vol. ix., p. 222; &c.)

OMAR II. (Abú Hafss), the eighth khalif of the family of Umeyyah who reigned in the East, was the son of Abd-al-aziz, and the nephew of Abd-al-malek. He succeeded his cousin Suleymán, in the month of Safar, A.H. 99 (Sept., A.D. 717). This khalif, who on his mother's (Umm-Ássem) side was the great-grandson of the first Omar, imitated in every respect the conduct and the virtues of his illustrious ancestor. He was simple, modest, and frugal; he loved justice so much as to sacrifice to it his own interests and those of his family. He was religious and devout, and his mind was always occupied with the idea of a future world. One of the first acts of his administration was to suppress the maledictions which, since the time and by the order of Muawiyah, the first khalif of his family, had been read in all the mosques against the partisans and descendants of Ali: he also restored to the latter the lands which the prophet had given to Ali, and decreed that the produce should be equally divided among their posterity. These and other acts of justice towards the proscribed race raised alarm among the members and partisans of the family of Umeyyah, and especially Yezíd, his cousin and successor. They feared lest Omar, carried away by his love of justice and his respect for the family of the prophet, should appoint a grandson of Ali to succeed him in the empire, and they decided to get rid of him. This they accomplished by administering to him a slow poison, from the effect of which he died at Hásserah, in Syria, in the month of Rejeb, A.H. 101 (Jan., A.D. 720), after a reign of two years and five months, in the forty-first year of his age. Omar had been extremely economical in his person and household, but his excessive liberality exhausted all his revenues; and at his death there was not in the royal coffers a sum sufficient to cover the expenses of his funeral.

(Abú-l-fedá, *Annales Moslemici*, vol. i., p. 267, et seq.; Al-makín, *Historia Saracenica*, p. 75, et seq.; Abú-l-faraj, *Historia Dynastiarum*, transl. by Pococke, edit. nov., p. 136, et seq.; Ockley, *History of the Saracens*, p. 244.)

OMAR, IBN AL-AFTTAS AL-MUTAWAKEL ALA-ILLAH (he who trusts in God), was the fourth and last sovereign of the dynasty of Beni Al-afttas, who reigned in the west of the Peninsula from A.H. 468 to 487 (A.D. 1017-1094). After the death of his brother Yahya Al-mansúr (A.D. 1082), Omar succeeded him in a kingdom which extended over the greatest part of Extremadura and Portugal, and the capital of which was the city of Badajoz. At that time the once powerful empire of the Beni Umeyyah had vanished, and Mohammedan Spain was divided into sundry petty kingdoms, whose rulers were continually waging war against one another. [MOORS.] One of the most active

and enterprising of these petty monarchs was Omar, who seems to have possessed all the qualifications of a good Eastern monarch—invincible courage, mild but impartial justice, and liberality touching upon prodigality towards the learned. Soon after his accession to the throne, hearing that Alfonso VII. was besieging Yahya, king of Toledo, in his capital, he sent his son Fadhl to his assistance with a considerable force; but after several sharp encounters, in which he lost the best of his men, Fadhl was obliged to retreat, and Toledo surrendered to the Christian king on the 25th May, A.D. 1085. The taking of that important capital, the rapidity with which Alfonso followed up his conquests, and, more than all, his declaration that he would not lay down arms until he had conquered the whole of Mohammedan Spain, threw alarm among the Moorish kings. After a meeting held at Cordova (A.D. 1086) as to the best means of humbling the pride and checking the power of Alfonso, it was agreed that Omar should write a letter, in the name of the other kings, to Yúsuf Ibn Táshefin, the Almoravide sultan of Marocco, and implore the help of his arms against the formidable Christian. Yúsuf, who was seeking for a pretext to leave his native deserts and settle with his ferocious bands in the fertile valleys of Andalusia, immediately seized on the opportunity offered him; and, crossing the strait, landed on the coast of Spain, in August, A.D. 1086. [ALMORAVIDES.] Omar and the other kings of Mohammedan Spain hastened to join the Africans with their best troops; and four months afterwards (December, A.D. 1086) was fought, not far from Badajoz, at a place called Zalaca, one of the most strongly-contested and most sanguinary battles on record. The flower of the Spanish chivalry remained on the field. Alfonso himself was severely wounded in the thigh, by the hand, as it is asserted, of Omar Ibn Al-afttas. Elated with success, the African conqueror soon turned his arms against those of his own faith, and the brave Omar became one of his first victims. After defending for some time his kingdom against the superior forces of his adversary, commanded by Seyr Ibn Abi Bekr, Omar was obliged to shut himself up in his capital, where he still held out for a considerable time. The inhabitants having at last obliged him to capitulate, Omar surrendered the city on condition that his life and property should be preserved. The African general agreed to the terms: but scarcely had Omar left Badajoz, with his family and a few faithful servants, when a body of cavalry, sent by Seyr, overtook them, and they were all put to death (Feb., A.D. 1090). This lamentable catastrophe has been recorded in a beautiful elegiac poem by an Arabian poet named Ibn Abdún. The poem is in the Bodleian Library at Oxford.

(Abú-l-fedá, *Annales Moslemici*, vol. iii.; Casiri, *Bib. Ar. Hisp. Esc.*, vol. ii., p. 178, et seq.; Conde, *Hist. de la Dom.*, vol. ii.; Cardonne, *Hist. de l'Afrique*, vol. ii.)

OMAR, IBN HAFSSU'N, a famous rebel who long defied all the power of the sultans of Cordova, was born at Ronda, of Christian parents, towards the middle of the third century of the Hejira. He was at first a tailor, but finding his profession beneath him, he repaired to Truxillo, a town in Extremadura, and enlisted himself as a soldier. We next hear of him as a captain of banditti in the hills of Andalusia, where he long baffled the pursuit of justice, and defeated all the troops sent for his apprehension. Some time afterwards, scorning his narrow limits, he went to the frontiers of Navarre, seized on a mountain fortress, and thence extended his ravages into Aragon. He appears to have soon subjected the neighbouring country. As his forces increased, he assumed the tone of a sovereign, excited the inhabitants to revolt against the sultans of Cordova, and made even an offensive and defensive alliance with Ordoño II., king of Asturias and Leon. Profiting by the internal troubles which at that time (A.D. 859) agitated the kingdom of Cordova [MOORS], then in the hands of a warlike but unfortunate prince, Mohammed I., this daring rebel, at the head of a powerful army, composed of Mohammedans and Christians, began to ravage the richest provinces of the empire, and to commit all manner of depredations, defeating in every encounter the royal armies sent against him. As might be expected, his success brought all the discontented under his standard: Abd-al-malek, the governor of Lerida, openly embraced his cause, and the example was followed by other local governors. Mohammed advanced to chastise the rebel at the head of his best troops (A.D. 866); but Omar, who had as much cunning as courage, seeing that he could not contend against the royal forces, had recourse to the following stratagem. By his messengers he persuaded Mohammed that his only object was to deceive their common enemies, the Christians, in order better to turn his arms against them; that he was still a true Mussulman, and a loyal subject. Mohammed praised him for his policy, promised him ample reward if he succeeded in his enterprise, and actually sent his own nephew, Zeyd Ibn Kásim, with a body of cavalry to strengthen Omar (A.D. 866); but no sooner had the prince and his followers reached the camp, than they were barbarously butchered by their treacherous allies. On receiving the news of this catastrophe, Mohammed swore to be revenged: he ordered his eldest son, Al-mundhir, to take the field against the rebels, enjoining him never to appear again in his presence unless he had completely crushed the perfidious outlaw. Al-mundhir sought Omar, who awaited his arrival without fear. In the bloody battle that ensued (A.D. 867) the rebels were cut to pieces, and their chief was obliged to seek refuge among the fastnesses of the Pyrenees. But Omar had too much spirit to be put down by one reverse, although he could scarcely depend on a few score of followers: he offered his services to the Navarrese, gained for them many fortresses, and received from them the title of king. The governors of Saragossa and Huesca having taken the field against him, he defeated their united forces, and conquered the whole country as far as the Ebro. This time the sultan Mohammed in person, accompanied by his son Al-mundhir, marched against the rebel. Omar endeavoured by light skirmishing to prevent a general engagement, but he was unsuccessful; and after a most bloody conflict, in which he himself was dangerously wounded, his army was completely defeated at Aybar, on the frontier of Navarre and Aragon, in A.D. 882. Omar contrived to escape from the field of battle, but he died the ensuing year from his wounds. He left a son, named Káleb, who inherited his courage, and who, more fortunate than his father, remained in undisturbed possession of Eastern Spain, where he had founded a kingdom, until he was ultimately put down by Abd-al-rahman III., in A.D. 919. Omar and his son Káleb have been often confounded by Cardonne and Casiri; and hence the error committed by M. de Sacy (*Biographie Universelle*, in voc. *Omar Ben Hafssoun*), who made one out of the two individuals.

(Conde, *Historia de la Dominacion de los Arabes en España*, vol. i., p. 294 et seq.; Casiri, *Bib. Ar. Hisp. Esc.*, vol. ii., pp. 34, 47, 108, et passim; Cardonne, *Hist. de l'Afr. et de l'Esp.*, vol. i., p. 289 et seq.; Roderici Toletani *Historia Arabum* ad calcem Erpenii *Historiæ Saracenicæ*, Lugd., Bat., 1625.)

OMAR, an eminent physician and mathematician, whose complete name and titles are Omar Ben Abderrahman Ben Ali Abulhakem Al-Kermani (the Carmanian, probably so called from his family having been originally natives of the province of Kerman, or Carmania, a country on the south-east of Persia). He was born at Cordova, A.H. 368 (A.D. 990), and travelled into the East for the purpose of improving himself in geometry and medicine. On his return to Spain he settled at Saragossa, where he died, at the age of ninety, A.H. 458 (A.D. 1080). He was particularly famous for his skill in performing surgical operations, but left no works behind him either on medicine or mathematics.

((*Arab. Philosoph. Biblioth.*, in Casiri, *Biblioth. Arabico-Hisp. Escurial.* tom. i., p. 436.)

OMAR, BEN-AHMED BEN-CHALDUN ABU MOSLEM AL-HADHRAMI, was probably born (as his name would seem to imply) in Hadhramaut, a province of Arabia. He gave his chief attention to geometry, astronomy, and medicine, in all of which branches of science he acquired great fame, and was no less eminent for his moral character than for his philosophical attainments. He died A.H. 449 (A.D. 1071), at Seville, in Spain, where he had been for some time settled.

(*Arab. Philosoph. Biblioth.*, loco citato.)

OMAYYADES, or UMAYYADES. [MOORS.]

OMBI. [EGYPT.]

OMEN, a sign or prognostication of future events, supposed to be an intimation from a superior power. According to Varro (*De Ling. Lat.*, lib. v., c. 7), the word is derived from the language of a person speaking; 'Omen, quod ex ore primum elatum est, *osmen* dictum;' which was also the opinion of Cicero (*De Divin.*, i., c. 45), who says, 'Neque solum Deorum voces Pythagorei observitaverunt, sed etiam

hominum, quæ vocant *omina*' (the Pythagoreans attended to the words not only of gods but also of men, which they called omens). The term afterwards comprehended all signs of future events.

In all probability there is no nation that has not at some time entertained a belief in omens. We find traces of it in the Scriptures. Among the Greeks and Romans it was general. The Persians, the Arabians, the Scandinavians, the Germans, the Icelanders, the antient Britons, and the early Christians, were all imbued with this superstition.

Many curious instances of Roman superstition with reference to omens are enumerated in Pliny (xxxviii. 2). The unlucky omens which preceded the battle of Cannæ are enumerated by Silius Italicus, lib. viii., v. 626, &c.; see also Lucan, i., v. 522, &c. Pausanias (iv. 13) enumerates the omens which announced the fate of the Messenians in their struggle with the Lacedæmonians. Suetonius (*Jul.*, § 59) says that Cæsar, in landing at Adrumetum in Africa with his army, happened to fall on his face, which was reckoned a bad omen; but, with great presence of mind, he laid hold of the ground with his right hand, and kissing it as if he had fallen on purpose, he exclaimed, 'Teneo te, Africa' (I take possession of thee, O Africa).

A superstitious regard to omens in our own country formerly made a considerable addition to the stock of human misery. Generally speaking, we now look back with indifference on the trivial and ridiculous accidents which alternately afforded matter of joy or sorrow to our ancestors. Nevertheless, in remote parts of the kingdom, a superstitious regard to omens still exists.

Wythers, in his 'Abuses stript and whipt,' 8vo., Lond., 1613, p. 167, says:—

'For worthlesse matters some are wondrous sad,
Whom if I call not vaine, I must term mad.
If that their noses bleed some certain drops,
And then againe upon the suddaine stops,
Or, if the babling fowl we call a Jay,
A Squirrell, or a Hare but crosse their way,
Or if the salt fall toward them at table,
Or any such like superstitious bable,
Their mirth is spoil'd because they hold it true
That some mischance must thereupon ensue.'

Dryden and Lee's 'Œdipus,' act iv., sc. 1, also satirises this superstition:

'For when we think fate hovers o'er our heads,
Our apprehensions shoot beyond all bounds,
Owls, ravens, crickets, seem the watch of death;
Nature's worst vermin scare her godlike sons;
Echoes, the very leavings of a voice,
Grow babling ghosts, and call us to our graves
Each mole hill thought swells to a huge Olympus,
While we, fantastic dreamers, heave and puff,
And sweat with an imagination's weight:
As if, like Atlas, with these mortal shoulders
We could sustain the burden of the world.'

Butler frequently alludes to omens in his 'Hudibras;' and by no writer have they been more successfully ridiculed than by Gay in his fable of the 'Farmer's Wife and the Raven.'

Dr. Hickes, in a Letter to Dr. Arthur Charlett, Master of University College, Oxford, dated January 23, 1711, preserved in the Bodleian Library, mentions 'the omens that happened at the coronation of King James II., which,' says he, 'I saw: viz., the tottering of the crown upon his head; the broken canopy over it; and the rent flag hanging upon the White Tower when I came home from the coronation. It was torn by the wind at the same time the signal was given to the Tower that he was crowned. I put no great stress upon these omens, but I cannot despise them; most of them, I believe, come by chance, but some from superior intellectual agents, especially those which regard the fate of kings and nations.'

Aubrey, in his 'Miscellanies,' 8vo., Lond., 2nd edit., p. 37-46, devotes a section to Omens.

OMENTUM is a broad band of membrane connecting two or more of the abdominal viscera. The chief of these membranes is the great omentum, or caul, which forms a large fold connecting the stomach with the transverse arch of the colon; others of less size and importance connect the stomach and liver, and the stomach and spleen. The great omentum always contains some fat surrounding its blood-vessels, so that it looks like a network of fatty tissue, and it is one of the chief seats of the accumulation of fat in corpulent persons, in whom it contributes largely to the peculiar prominence of the abdomen.

OMER, ST., a town in France, capital of an arrondissement in the department of Pas de Calais, 130 miles north of Paris in a direct line, or 138 miles by the road through Beauvais, Abbeville, and Hesdin, in 50° 45′ N. lat. and 2° 14′ E. long.

This town was antiently a village, with a castle called Sitieu; the sea is said then to have flowed up to the place. It was fortified with walls about the close of the ninth century, about which time it began to bear the name of its patron saint, Audomare, or Omer, bishop of Therouenne. It was included in the county of Flanders, and was among the possessions of the ducal house of Bourgogne, from which it was inherited by the Spanish branch of the Austrian family. The emperor Charles V. strengthened the fortifications; and in the sixteenth century the bishop's see was transferred hither from Therouenne. St. Omer was taken by the French in 1677, and confirmed to them the following year by the peace of Nimeguen. It was one of the places chosen by Napoleon for building his flotilla for the invasion of England. Part of the English contingent of the allied army of occupation encamped near the town in 1816. The diocese was suppressed at the Revolution.

St. Omer is a fortress of the first class; it is surrounded by fortifications between two and three miles in circuit, constructed of red bricks. It is strengthened by four forts and by entrenchments, and further protected by marshes, which can easily be flooded. There are four gates, of which only two will admit carriages. The town is traversed or surrounded by different branches of the canal of the Aa, and the canal of St. Omer, which unites the Aa and the Lys. The principal streets are broad, but there is only one *place*, or square. The houses are chiefly built of yellow or grey bricks, except some of the public buildings, which are of red bricks. There is a town-hall, forming one side of the square. There are four churches, two parochial and two subsidiary; two of the churches are fine Gothic buildings; that formerly attached to the abbey of St. Bertin is the finest, but was, in 1814, falling to ruin. The ex-cathedral is smaller than the church of St. Bertin, but in better preservation. The front of the church of the college, or high-school, is surmounted by two towers. The ramparts, which are planted with elm trees, the quays on the banks of the canal, and the Calais road, are used as public walks. There are many fountains.

The town formerly depended for support on the expenditure of the troops in garrison and of the great number of monks and other members of the religious orders. There were formerly twenty-five or twenty-six convents, including the abbey of St. Bertin, one of the richest and most famous of the Benedictine order in France, where Childéric III., the last of the Merovingian kings, was confined after his deposition, and where he died. There were also a seminary for the priesthood, and a celebrated English college for the education of young Roman Catholics of England and Ireland. The building formerly occupied by this college is now converted into a military hospital. The inhabitants of St. Omer amounted, in 1831, to 19,344; in 1836, to 19,032. They are engaged in the manufacture of candles, soap, starch, glue, woollen cloth, blankets, lace, fishing-nets, cord, linen thread, leather, and wicker wares, of which last a considerable quantity is exported. There are refining-houses for salt, dye-houses, breweries, distilleries, potteries, oil-mills, and some other industrial establishments. Trade is carried on in corn, wine, flax, oil, and coal. There are two considerable fairs in the year. There are in the town an Ursuline convent, a house of the Sœurs de la Charité, an hospital for orphans and foundlings, a military hospital, another hospital, two almshouses, a high school, to which is attached a public library of from 16,000 to 20,000 volumes, a school of drawing and architecture, a theatre, public baths, an arsenal, four powder-magazines, and three prisons. The canals and roads, which converge at the town and communicate with Abbeville, Boulogne, Calais, Dunkerque, and other places, promote its commercial and general prosperity.

North of the town are two suburbs: Haut Pont, extensive and well-built, on the banks of the Aa; and Lizel, the inhabitants of which are of Flemish origin, and preserve their language. They are mostly gardeners, and cultivate the marshes which were drained by their forefathers. This drainage is effected by means of ditches so numerous as to form a complete labyrinth, and to insulate almost every single field or garden. Each proprietor keeps his boat, by which alone he can reach the land which he cultivates; and in which he conveys part of his family, his gardening tools, and his produce. Vegetables, especially cauliflowers, are

cultivated rather than corn. The soil is remarkable for its fertility. The canals or pools of this marshy tract formerly contained many floating islands, of a few feet diameter, covered with grass and shrubs, which were regarded as objects of great curiosity; from neglect most of them have become attached to the bank or to the bottom of the ditches. Peat is dug in these marshes. The environs of St. Omer are fertile in corn, colza, flax and hemp, and afford excellent pasturage.

The arrondissement of St. Omer comprehends an area of 419 square miles, and includes 117 communes. It is subdivided into seven cantons, or districts, each under a justice of the peace. The population, in 1831, was 103,073; in 1836, it was 105,020.

OMERCUNTUC. [HINDUSTAN, vol. xii., p. 205.]

OMMIADE, or UMEYYAH DYNASTY. [MOORS.]

O'MNIBUS, a long-bodied coach or carriage, calculated to afford side-seats in the interior to twelve or fourteen persons. It was originated in Paris, in the year 1827, and derives its name from the last word of the inscription placed upon the sides of the earliest of those vehicles, namely, *Entreprise générale des* OMNIBUS. In the latter part of 1831 and beginning of 1832, omnibus carriages began to ply in the streets of London. Those from Paddington to the Bank were the earliest. Carriages of similar form were used in England as long stages more than forty years ago, but not answering the expectations of the proprietors in point of profit, they were soon laid down. Omnibuses began to run in Amsterdam in September, 1839.

OMSK. [SIBERIA.]

ON. [EGYPT.]

ONAGGA, or DAUW, names of the *Equus montanus* of Burchell. [HORSE, vol. xii., p. 314.]

ONAGRA'CEÆ. Under this name is comprehended a group of polypetalous exogenous plants, which, in their more complete condition, are certainly known by their inferior ovary, and by all the parts of the flower being four, or a constant multiple of that number. Thus in the plant now figured (*Jussiæa grandiflora*) there are four sepals, four petals, twice four stamens, four stigmas, four cells to the ovary, and the fruit when ripe bursts into four valves. The species characterised by this peculiarity are chiefly herbaceous plants, inhabiting the more temperate parts of the world, and have white, yellow, or red flowers, such, for example, as the great genus of Œnotheras, or Evening primroses, and the Epilobiums, which are so common as wild plants. It is only in the Fuchsia, which has a succulent fruit, and forms an approach to Myrtaceæ, that a woody structure is met with.



Jussiæa grandiflora.

1, a fruit nearly ripe, and surmounted by its four sepals; 2, a transverse section of the same, to show the four cells.

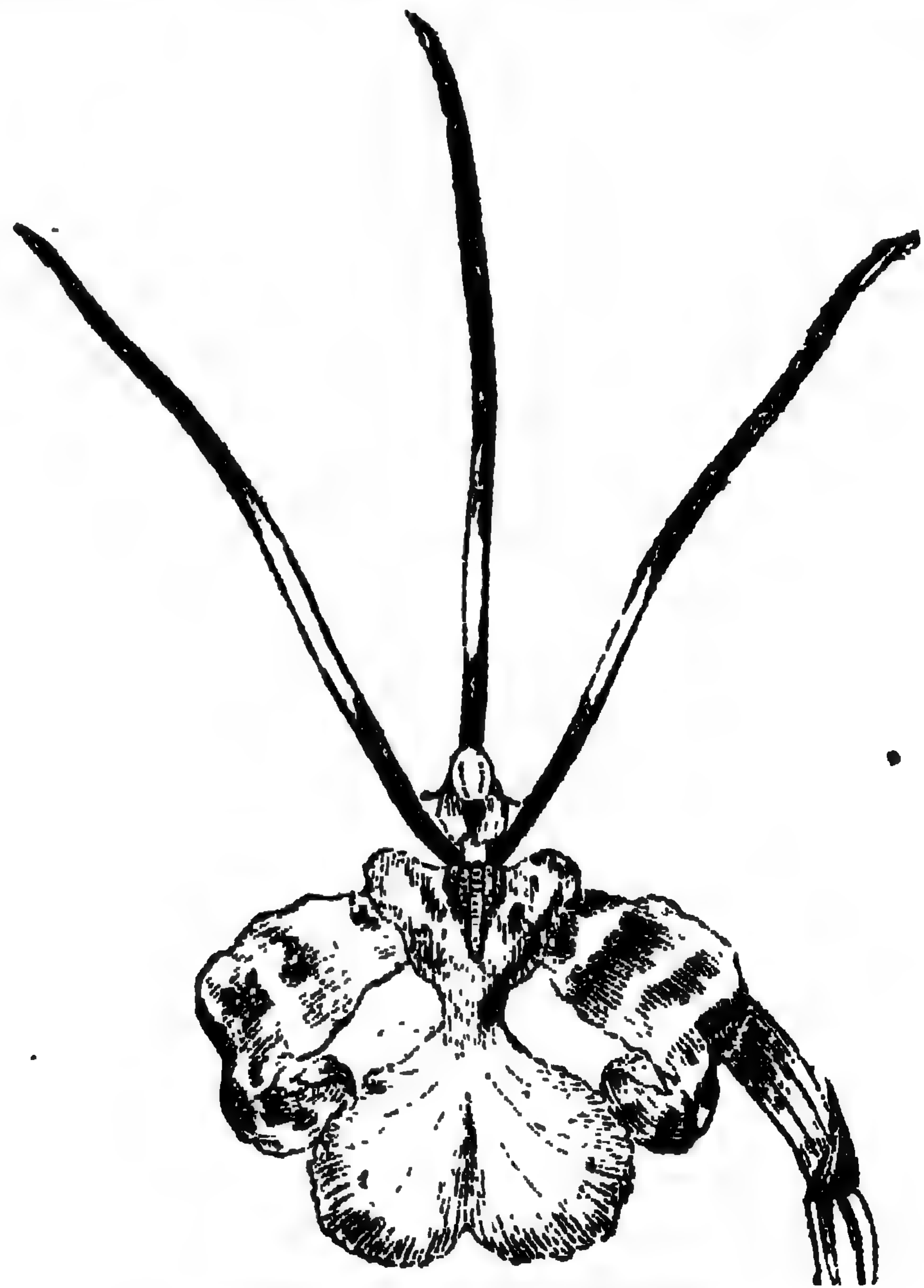
But although genuine Onagraceæ are thus plainly limited, botanists admit into the order other plants which do not possess the character proper to the order, and which are regarded as imperfect states of it. Thus *Hippuris*, which has only one stamen, no petals, and a one-celled ovary, is regarded as a case of degradation from the Onagraceous type; and *Lopezia*, with only one perfect stamen, one imperfect stamen, and two petals, is considered another but less degraded condition of the order. (De Candolle's *Prodromus*, vol. iii., p. 35.)

A large proportion of Onagraceous plants are ornamental, and consist of common garden flowers, especially the species *Œnothera*, *Godetia*, *Epilobium*, and *Fuchsia*; but none of of them possess any useful quality worth recording.

ONCHI'DIUM. [CYCLOBRANCHIATA, vol. viii., p. 249; LIMACIDÆ, vol. xiii., p. 486.]

ONCHIDO'RIS. [CYCLOBRANCHIATA, vol. viii., p. 249.]

ONCI'DIUM is a very large genus of tropical and subtropical Orchidaceæ, found in the western hemisphere, where the species are common, especially in Mexico and some of the West Indian islands, Brazil, and Peru. They have usually yellow flowers, spotted with a rich reddish-brown: sometimes the blossoms are purple, and more rarely white. They belong to the Vandeous section of their order [ORCHIDACEÆ], and are known by their labellum being broad, more or less lobed, distinct from the column, and furnished at the base with a tuberculated disk, which usually presents some grotesque appearance. Their sepals and petals are spreading, their column has a membranous ear on each side, and they have two pollen masses attached to a long caudicula. The most remarkable species is the Butterfly-plant, so called in consequence of the supposed resemblance of its flowers to some insect upon the wing. This is found in Trinidad, growing on the branches of trees, and bears a long, jointed, compressed, spotted scape, from the apex of which swings lightly a large yellow and brown flower, whose labellum is compared to the body of an insect, the column to its head, a pair of processes arising from the column to short antennæ, and the long narrow sepals and petals to legs. It is now common in hothouses.



Oncidium Papilio, or Butterfly Plant.

ONDA'TRA. [MUSQUASH.]

ONEGA, Lake. [RUSSIA.]

ONE'GLIA, a province and town of the Sardinian States in the western Riviera of Genoa, between the provinces of San Remo on the south-west and Albenga on the northeast. The Apennines bound it to the north, and separate it from the valley of the Tanaro in Piedmont. The province of Oneglia consists of several valleys sloping from the foot of the Apennines to the sea, and watered by mountain torrents. The principal stream, called the Impero, flows by the walls of Oneglia. The chief produce of the country is oil, of which 100,000 barrels are exported annually, partly by sea and partly by land, to Piedmont and Lombardy. The average price of each barrel on the spot is about two pounds sterling. The population of the province is 52,770, distributed into 67 communes.

1. Oneglia, where the authorities reside, is a town of

5400 inhabitants: it has a fine collegiate church, and a college kept by the fathers Scholarum Piarum. Oneglia is the birthplace of the celebrated naval commander and statesman Andrea Doria. In 1792 the French admiral Truguet appeared with his fleet before Oneglia, and sent a boat to summon the town to surrender, France being then at war with the king of Sardinia. The few soldiers in the town fired upon the boat, and killed some sailors and wounded the officer in charge of the boat. Upon this Truguet began a furious cannonade upon the town and almost entirely destroyed it. The people ran away to the mountains. The town has been since rebuilt, and it carries on some trade by sea. 2. Porto Maurizio, a few miles south-west of Oneglia, a busy thriving seafaring town, has a small harbour for boats and a roadstead for larger vessels: it contains nearly 7000 inhabitants, many fine houses, a handsome collegiate church, and several other churches with good paintings of the Genoese school. The surrounding hills and valleys are planted with olive-trees and studded with country-houses. 3. Diano, which is divided between Diano Castello, or Upper Diano, and Diano Marina, or the lower town, contains altogether about 9000 inhabitants, distributed in several villages or communes. The valley of Diano is one of the most fertile districts of the Riviera of Genoa. It produces oil and good wine. A great part of the population are sailors.

Oneglia was formerly a feudal principality, and once belonged to the family of Doria, who sold it in 1576 to Emmanuel Philibert, duke of Savoy and prince of Piedmont. From that time it remained subject to the House of Savoy, until the French occupation in consequence of the wars of the Revolution. At the Restoration it was formed into a province with the neighbouring Genoese district of Porto Maurizio. A new road leads from Oneglia over a pass in the Apennines, about 3000 feet high, to Ormea in the valley of the Tanaro in Piedmont.

(Serristori, *Statistica dell' Italia*; Bertolotti, *Viaggio nella Liguria Marittima*.)

ONEIDA. [NEW YORK.]

ONGAR. [ESSEX.]

ONION. The species from which the varieties of the common onion have been derived is the *Allium Cepe*. Its uses are almost universally known, and its cultivation is practised in most countries. The range of latitude within which it may be grown extends from the tropics almost to the coldest verge of the temperate zone. Its leaves and roots are of an annual nature, inasmuch as they die in the course of a single summer, after perfecting a bulb; the latter however is biennial, and capable of putting forth fresh roots and leaves in the following season, and of acquiring an increase in its size. This property is taken advantage of in one of the modes of cultivation.

The following are the principal varieties:—

Early Silver-skinned—valuable only on account of its earliness.

Silver-skinned—moderately large, flat, shining, white, mild.

Portugal—large, oblate, imported largely from the country of which it bears the name, but only adapted for a supply during the early part of winter: quality rather mild.

Tripoli—the largest of all the varieties: oval, or somewhat flattened, light red, mild, but does not keep long.

Spanish, or *Reading*—large, flat, white, mild; resembles the Portugal onion, but is better adapted for cultivation in this climate.

Strasburg—large, flat or globular, light red tinged with green, strong-flavoured, and keeps well.

Deptford and *Globe*—are subvarieties of the preceding, of milder quality, and yield generally good crops.

James's Keeping—large, pyriform, brownish-red; keeps remarkably well; flavour strong.

Blood-red—middle-sized, flat, deep red; keeps well, but of the strongest flavour, on which account it is medicinally preferred to the other varieties.

Yellow or *Straw-coloured* (*Ognon paille ou jaune* of the French)—small, globular, firm, valuable for pickling.

Two-bladed—small, roundish, green, with little foliage.

Potato or *Under-ground Onion*.—This peculiar variety forms numerous bulbs below the surface, which attain maturity early in the summer.

Tree or *Bulb-bearing Onion*—bears, instead of flowers, small bulbs, which are only useful for pickling.

Onions will succeed in any good rich soil, provided it be neither too wet and adhesive, nor, on the other hand, too dry and light. They may even be grown successively on the same spot for a number of years, contrary to what happens with the majority of crops. Abundance of well-prepared manure should be thoroughly incorporated in digging the soil. The dung of pigeons and poultry is used with advantage; and some, particularly the French gardeners, prefer sheep-dung.

The time of sowing the general crop is from the middle of February to the middle of March, according to the state of the ground and of the weather. The seeds may be sown broadcast or in very shallow drills: the latter mode admits of the ground being more easily stirred on the surface and kept clean. In either case the seeds should be covered as lightly as possible.

When the leaves indicate, by the general yellowness of their points, that their office has been performed, the necks should be bent, and the bulbs pulled up soon after, and spread so that their fibres and stems may dry and wither in the sun. They may then be stored up in any dry airy situation.

Very large onions may be obtained by sowing thickly in April on poor soil, so that the produce in the first summer may be of small size. The crop is then taken up as above directed, and the smallest and firmest are selected for planting in rich and well-prepared soil in the following spring.

Onions intended for pickling should be sown thickly on poor and dry soil. The silver-skinned, yellow, and two-bladed onions are the best varieties for this purpose.

For a supply of young onions in spring, the sowing should be made in August. Onions are sometimes attacked by a grub at the root. Trenching the soil to a good depth, soot, charcoal-dust, and lime-water, have severally been successfully applied as remedies.

ONI'SCIA. [ENTOMOSTOMATA, vol. ix., p. 456.]

O'NKELOS was the author of the most celebrated of the Targums, or Chaldee paraphrases of the Old Testament. [TARGUMS.] The age at which he lived cannot be determined with any certainty. Jahn concludes from his style that he wrote not later than the second or third century. The Babylonian Talmud states that he was contemporary with Gamaliel; this would place him about the time of Christ. From the mention made of him by the Babylonish Talmud, and from the purity of his language, which is much better Chaldee than that used in Palestine, and approaches more nearly than any other extant specimen of the language to the Chaldee in *Daniel* and *Ezra*, Eichhorn supposes that he was a native of Babylon. His Targum contains the Pentateuch only. It is a faithful version, and corresponds so exactly with the Hebrew text, that it used to be chanted to the same notes, alternately with the Hebrew, in the Jewish synagogues, down to the beginning of the sixteenth century. This Targum is not mentioned by Origen or Jerome, which may perhaps be accounted for by the circumstance that Origen did not know Chaldee, and that Jerome only learnt it late in life. The Targum of Onkelos is printed in the Antwerp and Complutensian Polyglotts, in Buxtorf's Hebrew Bible, and in Walton's Polyglott. It has been published separately at various times. The edition which has been generally followed is that of Venice, 1518, and 1525-6. It has been translated into Latin by Alfonso de Zamora, Paulus Fagius, Bernardinus Baldus, and Andrew de Leon of Zamora.

(Prideaux's *Connection*, pt. ii., bk. viii., p. 757; Horne's *Introduction*, vol. ii., p. 199; Jahn, *Introd. in Lib. Sac. Vet. Fœd.*, p. 59; Winer, *De Onkeloso ejusque Paraphrasi Chaldaica Dissertatio*, 4to., Lips., 1820.)

ONOMATOPE'IA (ὀνοματοποιΐα, ὀνοματοποίησις), which literally means 'the making of words,' is the name given to those words which are formed, or supposed to be formed, by an imitation of natural sounds. Thus, the words 'to neigh,' 'to murmur,' 'to bleat,' 'to creak,' and many others are supposed to be merely imitations of natural sounds; but the number of such words has been greatly exaggerated by some grammarians. Aristophanes imitates the croaking of the frogs by βρεκεκεκὲξ κοὰξ κοάξ (*Frogs*, l. 209), and Ennius the sound of the trumpet by the word *taratantara*. (Servius on *Æn.*, ix. 503.)

ONTARIO, LAKE. [CANADA.]

ONYCHOTEUTHIS. [TEUTHIDÆ.]

ONYCHOTHE'RIUM, Fischer's name for the *Megalonyx Jeffersonii*. [MEGATHERIIDÆ, vol. xv., p. 68.]

ONYX. [QUARTZ.]

OODIPOOR. [HINDUSTAN, vol. xii., p. 214.]

OOJEIN (*Ujjayini*), a principality in the province of Malwa, subject to Junkojee Scindia, situated on the right bank of the Sippra river, near to the south-western extremity of the province. The soil is very fertile, producing in ordinary seasons abundant harvests: but when the season is more than usually rainy, the ground is rendered so soft as to impede the operations of agriculture; and on the other hand, if the season should prove dry, the people are reduced to great extremity owing to the absence of wells and all other means for irrigating the lands. The town of Oojein is situated in 23° 11′ N. lat. and 75° 46′ E. long. Until the transfer of the seat of government to Gualior, Oojein was the capital of the Scindia Mahrattas; it was once a large and populous city six miles in circumference, the whole area being occupied with buildings, but many of the inhabitants have been drawn away since the departure of the court to Gualior and Indore, and the number of dwellings has rapidly and materially diminished. The greater part of the houses are low; scarcely any exceed two stories in height. Nearly all are built of mud throughout, walls, roofs, and floors being of that material. A few of the superior houses have wooden fronts, which are elaborately carved, and the roofs are tiled. Some of the members of the Scindia family still reside at Oojein. [HINDUSTAN.]

OOLITE, the characteristic rock of one of the great systems of secondary strata. [GEOLOGY.] One of the purest examples of oolite is the fine yellow freestone of Ketton in Northamptonshire, which is wholly composed of round grains of concretionary structure, *adherent* by their contiguous surfaces, so as to form a stone easily wrought with the chisel, and of a durable quality. The Bath freestone is another example, where the grains (often hollow) are *connected* by interposed calcareous matter; the Portland stone resembles the former, but contains disseminated or aggregated silex; and not to extend the catalogue, much of the Lincolnshire freestone is oolite, of which the round grains are firmly *compacted* in a general basis of crystallized carbonate of lime. The resemblance of the grains to small ova, or the roe of fishes, has given origin to the English term 'Oolite' (from the Greek ὠόν, *óon*, an egg), and the German 'Rogenstein,' or roestone.

Limestones possessing the oolitic character occur in different parts of the series of strata, but nowhere very abundantly except between the lias and the green-sands. Specimens may be found in the mountain-limestone at Clifton, Kirkby Lonsdale, &c., and in the magnesian limestone of Yorkshire and Derbyshire; and in this latter case the grains, large and distinct, show obviously the concentric lamination which belongs to certain oolites called 'pisolites,' and which may be detected in nearly all with the aid of the microscope.

OOLITIC SYSTEM. For the order of succession of the strata composing this great series of English strata see GEOLOGY. On the continent of Europe the corresponding strata receive, from their conspicuous development in the Jura Mountains, the titles of Jura Kalk and Calcaire Jurassique. [JURA.]

OONALASHKA is the most frequented of the Aleutian Islands, which stretch from the peninsula of Aliaska, a part of the continent of North America, across the Pacific towards the peninsula of Kamtchatka. It is situated in 54° N. lat. and 138° 20′ W. long., and extends from north-east to south-west about fifty miles in length, but it varies greatly in width. Black masses of rocks rise perpendicularly out of the sea to a great elevation, and their summits are covered with eternal ice. The highest summit, called Makushkain-sobka, is more than 7000 feet above the sea-level, and continues to smoke without interruption. There is also another active volcano. In 1795 a volcano rose out of the sea, about thirty miles west of the north-eastern point of Oonalashka. The rocks however are not composed of lava, nor has real lava been found, so far as the island has been yet examined. But there are several hot springs; and earthquakes are common. The rocks consist of granite and porphyry.

Oonalashka and the islands lying west of it are entirely destitute of trees. Willows occur in damp places, but they hardly rise above the luxuriant growth of grass and herbs. Even the lower hills only support alpine plants. The moisture of the atmosphere maintains a perpetual verdure on the steep mountain-summits up to the snow. The Russians have brought cattle to the island, and Lütke, in 1826, was able to get beef. Potatoes, turnips, and radishes are the only vegetables that thrive. No kind of grain succeeds. The lower shores of the islands are often lined with drift wood, which consists of pines, and several kinds of trees which grow in a much warmer climate, as the camphor-tree.

The inhabitants live chiefly by fishing. The surrounding sea abounds in cod, halibut, &c., and especially in seals. Whales are also numerous. Wild geese and ducks are very abundant in spring and autumn; they are salted and smoked for winter food. The eggs of the sea-fowl, which hatch in the neighbouring islets and rocks, are also collected. The inhabitants are Aleutians: their number is very small. The Russian American Company has an establishment at Illiuliuk, or Illoaloak, towards the north-eastern extremity of the island, which, in 1826, was inhabited by twelve Russian and twenty Aleutian families. The harbour, being surrounded by high mountains, is very safe, but it has the disadvantage of being difficult of access, owing to the entrance being narrow, tortuous, and there being no bottom at 100 fathoms. The climate of this place is rather wet than cold. There are almost continual fogs during the winter, and rain is abundant all the year round. The mean annual temperature is as high as 40°, which is one degree above that of Trondhiem in Norway, and not quite two degrees less than that of Christiania.

(Sauer's *Account of a Geographical and Astronomical Expedition to the Northern Parts of Russia*; Langsdorf's *Voyages and Travels in various Parts of the World*; Kotzebue's *Voyage of Discovery into the South Sea and Behring's Strait*; Lütke's *Voyage autour du Monde*.)

OORT, ADAM VAN, son of Lambert Van Oort, was born at Antwerp in 1557. He derived his instruction from his father, and soon rose into esteem as a painter of history, and likewise as an able painter of landscapes. Van Oort's greatest honour however is, that he was the first instructor of Rubens, whose works have immortalised his master's name as well as his own.

Though in his best time his composition was agreeable and the drawing correct, he neglected the study of nature, and was entirely a mannerist. He seems not to have looked on painting as a fine art, but as a means of acquiring wealth. In his latter time his performances had little to recommend them except freedom of handling and good colouring. Yet, with all his defects, he was looked upon as a good painter; and Rubens used to say that if he had studied at Rome, he would have surpassed all his contemporaries. He died in 1641, aged 84.

OPAL. Of this mineral, which is essentially a hydrate of silica, there are mentioned by Mr. Brooke, in the 'Encyclopædia Metropolitana,' eleven varieties, and nearly as many are described by Phillips.

Precious Opal, or Noble Opal.—This mineral is white, bluish or yellowish white, and exhibits a beautiful variety or play of colours, as blue, green, yellow, and red, several of which appear together. Fracture conchoidal, with a vitreous or resinous lustre: it is easily broken, but scratches glass. Specific gravity 2·06 to 2·09. Infusible by the blowpipe, but becomes opaque and loses water. The most beautiful specimens occur in Hungary, but it has also been found in Saxony, South America, &c. Analysis of the Hungarian opal by Klaproth:—Silica, 90; Water, 10.

Fire Opal.—In this the internal reflection is bright red. It occurs with the precious opal in Hungary, and has also been found in Cornwall.

Hydrophane.—It is usually opaque, but is rendered transparent and exhibits the iridescent colours of the precious opal by immersion in water. According to Klaproth it contains a little alumina in addition to silica and water.

Common Opal.—This is of various shades of colour, as white, green, yellow, and red; but is entirely destitute of the play of colours exhibited by the noble opal. In other properties they greatly resemble each other. It is stated to contain a little oxide of iron mixed with the silica and water. It is found chiefly in Hungary and Saxony, but specimens have also been produced in Cornwall.

Semi-Opal.—This is more opaque than common opal, and is dull. It occurs either white, grey, yellow, brown, or green. It is found in the same places as the foregoing.

Wood Opal, so called from its showing the woody structure. It occurs of several tints of white, grey, brown, and black. It is generally harder than semi-opal, but does not materially differ from it in other properties. It occurs in Hungary and in Transylvania.

Cacholong is white opaque opal; harder than common opal: dull; brittle; fracture flat conchoidal. Specific gravity 2·2. Infusible before the blow-pipe. It is found on the banks of the river Cach in Bucharia, in loose masses. It occurs also in the Faroe Islands, Greenland, and Iceland.

Opal Jasper. Ferruginous Opal.—Opaque, or but feebly transparent on the edges. Colour generally deep shades of red, yellow, and grey. Fracture flat conchoidal. It appears to be a silicate of iron with water. Klaproth's analysis of a variety from Telkebanya gave—Silica, 43·5; Oxide of Iron, 47·0; Water, 7·5. It occurs in Hungary, Siberia, &c.

Menilite.—Occurs in irregular or reniform masses. Colour usually smoke-brown. Opaque, or slightly translucent. It occurs at Menil-montant, and St. Ouen near Paris, in beds of adhesive slate. According to Klaproth it consists of—Silica, 85·5; Alumina, 1·; Water, inflammable matter, and traces of lime and iron, 11·.

Hyalite. Muller's Glass.—Occurs in small globular and botryoidal forms. Lustre vitreous. Brittle, but scratches glass. Specific gravity about 2·4. Infusible by the blow-pipe. It occurs in amygdaloid, near Frankfort-on-the-Main, in Hungary, &c. According to Bucholz it consists of—Silica, with a trace of alumina, 92·; Water, 6·3.

Geyserite. Siliceous Sinter.—This mineral is white, or yellowish or greyish white. It is brittle. Specific gravity about 1·807. Infusible *per se* by the blow-pipe. It is deposited by the hot springs of Iceland and elsewhere. According to Klaproth it consists of—Silica, 98·; Alumina, 1·5; Iron, 5·.

OP'ERA (Ital., *work*), a regular drama set to music, always accompanied by scenic representation, frequently by machinery, and sometimes by dancing. The true Opera, as found on all the Italian stages, whether in Italy or elsewhere, and as performed in the French language at the *Académie Royale*, admits no speaking; all is recitation or air, &c.; while what is called Opera in the national theatres of Germany and England, as well as the French *Opéra Comique*, is of a mixed kind—partly spoken, partly sung.

The constituents of an opera, says Rousseau, are, the Poem, the Music, and the Decorations. The poetry addresses itself to the mind, the music to the ear, the painting to the eye; and it is the duty of the three to unite their powers, in order to move and make an impression on the heart. Here, as in his well-known definition of music [MUSIC, p. 19], Rousseau degrades the art which is the vital part of the opera, to a mere sensual enjoyment; but in the very next sentence he betrays that inconsistency which we have before had occasion to notice, by declaring that music is able to paint every picture and excite every passion; to give to poetry new force, to decorate it with new charms, and thus at once to exalt and triumph over it. If the opera music of Rousseau's time, most of which is now deservedly forgotten, could embellish, could add a single beauty to the poetry of Apostolo Zeno and of Metastasio, how much more must the feeble lyric drama of a later period be indebted to the exquisite melodies, the soul-stirring harmonies, of a Cimarosa and a Winter, of a Mozart and a Rossini! The fact is, that the poetry of an opera has long ceased to be considered otherwise than as a vehicle for music, and, but for the scenery and decorations, the saying of the Abbé Arnaud, that *the Italian opera is a concert, of which the drama is the pretext*, would be applicable to nine in ten of all productions of the kind that have appeared during the last seventy or eighty years.

Rousseau, Algarotti, Arteaga, and most writers on the Opera, refer to it as performed at the *Académie Royale*, and on the stages of Milan, Turin, Naples, &c., where the accessories—the scenery, machinery, and decorations—have always been splendid and appropriate, and not such as are so frequently witnessed at the two Italian theatres of London and Paris. Voltaire, in the following panegyrical lines, had in view the *grand opéra* of the French capital, in which the *ballet* was, and still is, quite on an equal footing with the opera.

> 'Il faut se rendre à ce palais magique,
> Où les beaux arts, la danse, la musique,
> L'art de tromper les yeux par les couleurs,
> L'art plus heureux de seduire les cœurs,
> De cent plaisirs font un plaisir unique.'

And in all Opera-Houses, properly so called, beautiful scenery, and rich decorations of every kind, which will never cease to captivate, will always be required; though it is probable that the increasing taste for music in France and England will soon lead to its being considered of such paramount importance in those countries, that the Ballet will lose much of its attraction, and by being reduced to a very subordinate and less costly condition, enable managers either to bestow more expense on the opera, in all its parts, or to diminish the prices of admission, now so exorbitantly high.

The moment that the Opera appeared out of its native country, and especially when it reached the British shores, it was attacked by a host of critics and wits. Addison and Swift were among the first to level the shafts of ridicule at it, and were followed by Pope, Young, and many others. Addison lived to retract his opinion, for some of the absurdities which the opera in its infant state presented were soon corrected; though certainly enough remained, and must for ever remain, to sanction the objections of those who tried, or may still judge, the melo-drama by the cold stubborn laws of unpoetical probability. There were not wanting however defenders of this favourite child of the gay and fashionable world, and foremost among them was the author of the verses above quoted, whose candid apology for the Opera—in the preface to his tragedy of *Oedipe*—we shall here translate.

'The opera,' says M. Voltaire, 'is a representation as whimsical as it is magnificent; where the eyes and ears are more satisfied than the judgment; where a subjection to music produces faults of the most ridiculous kind; where it is necessary to sing airs while destroying a city, and to dance around a tomb; where are seen the palace of Pluto and that of the Sun, together with gods, demons, magicians, monsters, and temples erected and destroyed in the twinkling of an eye. We tolerate these extravagancies, we even admire them, because we imagine ourselves in fairy-land; and as we find splendid scenes, elegant dances, fine music, and some interesting scenes, we are content. It would be as absurd to require unity of time, place, and action in *Alcestis*, as to introduce dances and devils in *Cinna* or *Rodogune*. Nevertheless, though operas are released from such rules, the best of the kind are those in which they are least frequently violated. . . . . I reasonably require more perfection in a tragedy than in an opera, because in the former my attention is undivided—because in that my pleasure does not arise from a saraband or a *pas de deux*, for it is my mind alone that is to be gratified.'

Some of the absurdities of the opera are common to all dramatic representations, and those which are peculiar to it are now far less numerous than in 'the good old times.' This species of entertainment, though susceptible of much improvement, has not stood quite still while everything else, or nearly everything, has been advancing. That prominent feature however in the musical drama, which from the very first proved so obnoxious to ridicule, continues unaltered—the Recitative, which provoked the satire of our forefathers, and is yet rather tolerated than approved by the many—if a fault, is, we believe, a fault not imputable to the moderns, but to those whom it has hitherto been thought right to consider as the models of dramatic propriety and poetical taste. This leads to an inquiry concerning the origin of the melodrama—*i.e.* the musical drama, or opera.

That the opera, properly so called, whether Italian or French, is the offspring of the Greek drama—an opinion that for years past has been gaining ground—is supported by the most learned and able writers on the subject, and seems likely ere long to be universally adopted. The first that we have met with who has touched on this point is the 'philosopher of Malmsbury,' Hobbes, who, in a letter to Sir William D'Avenant, says, 'There is, besides the grace of style, another cause why the antient poets chose to write in measured language, which is this:—their poems were made at first with intention to have them sung, as well epic as *dramatic* (which custom hath long time been laid aside, but *began to be revived* in part *of late years in Italy*), and could not be made commensurable to the voice or instruments in prose—the ways and motions whereof are so uncertain and undistinguished (like the way and motion of a ship in the sea), as not only to discompose the best composers,' but also to disappoint sometimes the most attentive reader, and put him to hunt counter for the sense. It was therefore necessary for poets in those times to compose in verse.' This letter is dated Paris, 1650; consequently written anterior to the establishment of the *Académie Royale*, or French opera.

Dryden, in the beginning of the preface to his *Albion and Albanius*, rather hastily calls the opera 'a modern invention, though built upon the foundation of the ethnic worship,

and conjectures that it was borrowed from the Spanish Moors; but in a postscript to the same, he corrects himself in the following rather awkwardly-expressed manner: 'Possibly the Italians went not so far as Spain for the invention of their operas: they might have it in their own country, and that by gathering up the shipwrecks of the Athenian and Roman theatres, which we know were adorned with scenes, music, dances, and machines, especially the Grecian.' The learned Jesuit, Père Menestrier, in his work, *Des Représentations en Musique*, maintains that the antient tragedies were chanted. Metastasio, in his *Estratto della Poetica d'Aristotile*, expresses a most decided opinion that the Greek and Roman dramas, both tragedies and comedies, were sung, and cites in proof of this numerous classical authorities. Pye, in his *Commentary on the Poetic of Aristotle*, while disputing some of the inferences of Metastasio, is obliged, though unwillingly, to acknowledge that the opera 'most probably' is 'a lineal and legitimate offspring of the Greek tragedy,' and that the vastness of the Roman theatre 'turned the necessary means of modulating the voice into a real musical accompaniment;' that is to say, the magnitude of the place rendered chanting or recitative unavoidable.

Rousseau is disposed to combat the opinion that the opera is a derivative of the antient drama, but admits that the Greek tragedies were recited in a manner much resembling singing, that they were accompanied by instruments, and that choruses formed part of them. He afterwards says 'that all Greek poetry was delivered in recitative, because, the language being melodious, it was sufficient to add thereto the cadence of the metre, and a sustained recitation, to render such recitation perfectly musical.' Granting the recitative and chorus, it seems to us that the lineal descent of the opera is proved. The reader will find other evidence on this subject in our article Music, pp. 24, 26, first columns.

But the resemblance of the opera, as it first appeared, to the antient drama, will amount to little less than identity, if the statement and reasoning of the erudite author of *A Dissertation on the Rise, &c. of Poetry and Music* are admitted. Dr. Brown (more known by his *Estimate of the Manners and Principles of the Times*), after showing, to us in a very satisfactory manner, that the Greek drama was musical, proceeds to state, that 'the same union was borrowed and maintained through the several periods of the Roman empire. If therefore we suppose, what is altogether probable, that the form of the antient tragedy had been kept up in some retired part of Italy which the barbarians never conquered, we then obtain a fair account of the rise of the modern Opera, which hath so much confounded all inquiry.'

'As Venice,' the writer continues, 'was the place where the opera first appeared in splendour, so it is highly probable that there the antient tragedy had slept in obscurity during the darkness of the barbarous ages. For while the rest of Italy was overrun by the nations from the north, the seas and morasses of Venice preserved her alone from their incursions. Hence, history tells us, the people flocked to Venice from every part of Italy; hence the very form of the republic hath been maintained for thirteen hundred years; and from these views of security, it was natural for the helpless arts to seek an asylum within her canals from the fury and ignorance of a barbarous conqueror. Other circumstances concur to strengthen this opinion. The Carnival first appeared in splendour at Venice, beyond every other part of Italy. Now the Carnival is, in many circumstances, almost a transcript of the antient *Saturnalia* of Rome.'

'That the modern Opera,' Dr. Brown proceeds, 'is no more than a revival of the old Roman tragedy, and not a new invented species, will appear still more evident, if we consider that it is an exhibition repugnant to the universal genius of modern customs and manners. We have seen the natural union of poetry and music as they rise in the savage state, and how this union forms the tragic species in the natural progression of things. Hence we have deduced the musical tragedies of antient Greece. But in antient Rome, it appears, they arose merely from imitation and adoption. Nor could it be otherwise, because the Romans wanted the first seeds or principles whence the musical tragedies of the Greeks arose. The same reasoning takes place with respect to the modern opera: it emerged in that very city where, most probably, it must have lain hid; in a city whose other entertainments are evidently borrowed from those of antient Rome. And if to these arguments we add, that the subjects of the very first Operas were drawn from the fables of antient Greece and Rome, and not from the events or achievements of the times; and further, that in their form they were exact copies of the antient drama; such accumulated proofs amount to nearly a demonstration that the Italian Opera is but a revival of the old Roman tragedy.' (pp. 201-203.)

Some writers imagine that the modern musical drama originated in Italy, towards the latter part of the fifteenth century. Menestrier believed, on the authority of Sulpitius, that the first opera was performed at Rome about the year 1480, and that a few years after, a gentleman of Lombardy, named Botta, entertained a duke of Milan with a sumptuous supper, accompanying each course with a kind of opera (*une espèce d'opera*). Performances of the latter kind certainly could not have exceeded a single scene. But after collating what has been stated by various authors, we are persuaded that no regular opera was produced and publicly performed till Ottavio Rinuccini wrote and Jacopo Peri composed the drama of *Euridice* for the nuptials of Henri IV. of France and Mary of Medicis. This was represented in a very splendid manner at Florence, in 1600, and there published in the same year. Dr. Burney tells us (*Hist.*, iv. 25) that he was never able to find more than one copy of Peri's *Euridice*, which was in the library of the Marchese Rinuccini, a descendant of the poet. Having the good fortune to possess this very rare work, which is now before us, we can corroborate what the musical historian has said of it, that it is printed in score and barred, two very uncommon circumstances at the time of its publication; that the recitative seems to have been not only the model of subsequent composers of early Italian operas, but of the French operas of Lulli; that figures are often placed over the base to indicate the harmony; that the time changes as frequently as in the old French serious operas; and though the word *aria* occurs, it is difficult to distinguish air from recitative by any superiority of melody, except in the choruses. There is no overture to this, but a musical prologue of seven stanzas instead, sung in the character of Tragedy. Peri, in an address to his *readers* (*à lettori*), gives an account of his orchestra, which was placed behind the scenes, and consisted of a harpsichord, a large guitar, a *lira grande* (i.e. a *viol da Gamba*, according to Burney), and an arch-lute.

The Bolognese dispute with the Florentines the honour of having first produced a musical drama, but it appears that the *Euridice* was performed in their city the year after it had been produced at Florence. The opera was introduced at Venice in 1637, at Naples in 1646, and at Rome in 1671.

The Italian Opera made its way to London by slow and cautious steps. The sudden introduction on the public stage of a foreign language, and that language delivered in recitative, would have put the tolerating spirit of our countrymen to a trial far too severe to be prudent; the event therefore, which was anxiously wished for by the higher orders, to whom novelty is everything, and by those who had acquired a new taste in their travels, was gradually brought about. In July, 1703, Italian *intermezzi*, or 'interludes and musical entertainments of singing and dancing,' were performed at York Buildings. Two years after, *Arsinoe*, translated from the Italian, the dialogue and narrative parts in recitativo, and the singers all English, was produced at Drury Lane; the pit and boxes were allotted to subscribers. 'Before and after the opera, dances and singing, by Signora Margarita de l'Epine.' In 1706 *Camilla*, also a translation, was performed by the same persons in a similar manner. The next year witnessed a further and still bolder advance towards the final introduction of the exotic melo-drama; *Thomyris, Queen of Scythia*, was brought out at the same theatre, in which Urbani, a castrato, and two foreign women sang their parts in Italian, the other performers singing theirs in English! At length, in 1710, *Almahide*, written wholly in Italian, and performed exclusively by foreign singers, was presented to the public at the Queen's theatre in the Haymarket. Thus the Italian Opera gained a settlement in this country; and in spite of some opposition and much ridicule by which it was at first attacked, soon became firmly fixed, and at length seems to be as necessary, as a source of amusement to the metropolis of this kingdom, as any other favourite and long-established entertainment.

The Italian Opera was brought into France in 1646, by

the Cardinal Mazarin, and continued for some years to be performed at the Louvre; but the establishment of the *Académie Royale de Musique*, in 1670, superseded it, and except in 1772, when a troop of Italians represented Pergolesi's *Serva Padrona* as an *intermezzo*, between the acts of Lulli's *Acis et Galatée*, it never again was heard in Paris till introduced there early in the present century.

The grand French Opera is the legitimate melodrama, being wholly musical, and was founded by Louis XIV. In 1669 that monarch granted letters-patent to the Sieur Perrin for the establishment of an '*Académie des Opera en Langue Française*,' who taking as his partner the Sieur Cambert as composer, commenced his undertaking at the *Théâtre de l'hôtel de Guenégaud*, in 1671, where he produced *Pomone*, the poetry by himself, and set to music by his colleague. This is a pastoral drama, opening with a musical prologue of about thirty lines, in which the author has contrived to stuff a greater quantity of nauseous flattery of the *Grand Monarque* than perhaps was ever compressed into so small a compass. In 1672 the privilege was transferred to Lulli, who, with the assistance of Quinault, a lyric poet of very superior genius, conducted the *Académie* in a most able and successful manner till his death. [LULLI.] The *Opéra Comique* had its birth in France in 1750, in imitation of the Italian *Opera buffa*. This however is of the mixed kind, the dialogue being spoken.

The genuine Italian Opera has long flourished in Germany. 'The emperors,' says Burney, 'from the time of Ferdinand II. to Charles VI., seem to have had an invariable partiality for the Italian language and music. On the birth of an archduchess in 1724, an opera was exhibited at Vienna with uncommon magnificence. The performers were all persons of high rank, and his imperial majesty himself accompanied the voices on the harpsichord, as principal director.' The opera, entitled *Eurysteus*, was written by Apostolo Zeno, and composed by Caldara. That imperial poet-laureate was succeeded in office by Metastasio, who wrote many of his admirable lyric dramas for the Italian theatre at Vienna, which were set by the great masters of the day. His *Clemenza di Tito*, as composed by Mozart, will for ever be considered, by all true judges of dramatic poetry and music, as the most beautiful and finished example of the melodrama that human genius ever produced. For the different German courts some of the finest operas have been composed, but we can here only refer to the names of their authors, HANDEL, GRAUN, HASSE, GLUCK, WINTER, MOZART, &c.

What is called English Opera is, with two or three exceptions, of the mixed kind. The first that we have any account of that can be relied on is Shadwell's *Psyche*, composed by Matthew Lock, and brought out in 1673. Two years after, Dryden wrote his *Albion and Albanius*, an opera, set by a Frenchman, Louis Grabut, whom, to please the antinational king, Charles II., Dryden, in a preface to the work, praises in high though most undeserved terms, at the expense of his countrymen. But when that great poet wrote his *King Arthur*, he was fain to apply to Purcell for assistance, whose music has saved it from the oblivion to which it would otherwise be condemned. The poet, in an epistle-dedicatory to this, takes an opportunity of retracting his opinion of English composers. He says that music had then 'arrived to a greater perfection in England than ever formerly; especially passing through the artful hands of Mr. Purcell, who has composed it with so great a genius, that he has nothing to fear but an ignorant ill-judging audience.' Addison's *Rosamond* was, it is to be supposed, a real opera, the dialogue in recitative. This was represented in 1707, but failed, as Hawkins tells us, owing to the poverty of the music by one Clayton. *The Beggar's Opera* is so well known that it need only be named. The music is a good selection of the airs most popular at the time, arranged by the celebrated Dr. Pepusch. *Artaxerxes*, by Dr. Arne, is the only opera, strictly so called, that keeps its place on the stage. This is nearly a translation of Metastasio's *Artaserse*, by the composer himself, and though at the time severely criticised, is far superior to most of the musical dramas that have since been written. The music is rich in beautiful melody, and if other attempts at an English recitative opera had proved equal to this, the melodrama might now have been firmly rooted in British ground. Arne composed many other charming musical pieces; his *Love in a Village* will never be superannuated; and in truth, if the dramatic music of some of our countrymen who charmed the public ear during the latter half of the last century could be heard without prejudice, and without that yearning after what is foreign and new which characterises 'the fashionable world,' and others who yield to its influence, it would be admitted that in original expressive melody we are inferior to no nation in Europe, startling as the proposition may be to those who have not impartially and duly considered the subject. [ARNE; JACKSON; LINLEY; DIBDIN; SHIELD; ARNOLD; STORACE.]

OPERA. [ENGLISH DRAMA, vol. ix., p. 409.]

OPERATION. This article is to be considered as a continuation of NEGATIVE AND IMPOSSIBLE QUANTITIES, and as a development of the views of the nature of algebra there laid down. It cannot be read entire, except by students who have some acquaintance with the Differential Calculus, &c.

The great considerations on which the mathematics are founded have always, until lately, been stated as those of number and space; so that arithmetic and geometry have been called the wings of the exact sciences. This similitude, suggested by the twofold character of its objects of comparison, may be carried a step further; for as wings will not enable a bird to fly without nerves and sinews, so the mere consideration of space and number will never make a mathematician, without an organised method of using the ideas of both. We have already [MATHEMATICS] suggested that the science of operation must be a constituent part of mathematics; but it has always been so mixed up with the sciences bearing names derived from number and measure, that until lately it has had neither separate name nor existence: and even now, what has been done in it is only the mere beginning of a system.

The use of symbols of operation not standing for magnitude but for directions how to proceed with magnitudes, began with Leibnitz and Newton, before whose time all algebraical characters denoted simple numbers. The progress of the Differential Calculus forced the attention of mathematicians upon modes of denoting, not results of processes, but ways of proceeding. The generalizations arising out of the organization which notation gave to processes led to the use of indefinite and arbitrary symbols of operation. [FUNCTION.] Finally, it was observed that the symbols of operation employed in many general theorems would give simple and well-known relations if their meaning as symbols of operation were forgotten, and they were considered as symbols of quantity. For example, if $\Delta\phi(x)$ denote $\phi(x+1)-\phi x$, Δ being a symbol, not of a quantity multiplying ϕx, but of an operation to be performed upon ϕx; and if $D\phi x$, $D^2\phi x$, &c. denote the successive differential coefficients of ϕx, Taylor's theorem gives

$$\Delta\phi x = D\phi x + \frac{1}{2}D^2\phi x + \frac{1}{2.3}D^3\phi x + \dots .$$

If Δ and D had stood for quantities (which they do not), the preceding equation might have been divided by ϕx, and the result would have been

$$\Delta = D + \frac{1}{2}D^2 + \frac{1}{2.3}D^3 + \dots . = \epsilon^D - 1 \dots . (A)$$

If such a result had been obtained by those mathematicians who first ventured on the use of a negative quantity, they would doubtless have given to operations a sort of existence as quantities, and would have felt no repugnance to say that the direction to change ϕx into $\phi(x+1)-\phi x$ was equal to ϵ raised to the power of a direction to differentiate ϕx diminished by a unit. This might have beat their negative quantity (or arithmetical quantity less than nothing) in the complication of its absurdities, but not in absolute impossibility. Let two persons be required, the one to take four pebbles out of three, and the other to subtract a unit from (not the differential coefficient of ϕx, but) the direction to take the differential coefficient of ϕx, and it could hardly be said that the first had a more hopeless task than the second.

The modern mathematicians, with Lagrange at their head, had had too much experience of the nature of extensions to hazard any assumption upon the properties of symbols of operation, when separated from the quantity to be operated upon. The first step made was the observation that certain theorems involving symbols of operation might be easily remembered by the resemblance of the formulæ to well-known expressions, in fact, by the coincidence of those formulæ with the expressions, on the supposition that

the symbols of operation are changed in meaning, and become symbols of quantity. And if it be said that these mathematicians were saved from introducing a difficulty analogous to that of negative quantities by the want of resemblances to the course they might have adopted already existing in common modes of speaking and common views of arithmetic, it may be answered that such was not the case, but that it would have been easy, and was not without precedent, to consider arithmetic itself as a science of operations upon one single magnitude, the unit. If we always express the unit by I, we may, if we please, consider 2 not as I+I, but as the direction to perform upon I the operation I+I; so that 2 being merely a direction what to do, 2 I may represent the result of so doing: similarly 3 may be the direction to proceed as in I+I+I, and 3 I its result. And 3×2 would be a direction to perform 3 upon the result of 2, or to take 2I+2I+2I, or (I+I)+(I+I)+(I+I), or 6I. If then we say $3\times(2\text{I})=6\text{I}$, we have an equation between magnitudes; but if we throw away I, as we just now did ϕx, we have $3\times 2=6$, an expression of equivalence of operations. Now it might very reasonably have been asked whether *these* operations must be the only ones which will admit of being treated by themselves and viewed independently of the subjects of operation; and a direct assumption of such modes of notation as that marked (A), even when Δ and D were considered independently, though it might not have been fully explicable, would have appeared to be nothing but a natural extension of views which had already been taken to a limited extent.

The process however which was actually followed was this: forms similar to (A) having been observed, in which, whatever might be thought of them as they stood, were found ready means of returning to well-known truths, it was natural to ask whether an application of algebra to the form (A), producing of course a transformation of both sides, would lead to a result from which, by the same method of returning, another known truth might be produced. For example, assume that D and Δ are to be treated as quantities, and $\Delta=\epsilon^{D}-1$ gives $1+\Delta=\epsilon^{D}$, $\log.(1+\Delta)=D$, or

$$D=\Delta-\frac{1}{2}\Delta^2+\frac{1}{3}\Delta^3-\ldots.$$

Now restore ϕx to every term, and let D and Δ reassume their operative meanings, so that $D\phi x$ is the differential coefficient, and $\Delta\phi x$, $\Delta^2\phi x$, &c. are the successive DIFFERENCES of ϕx, x being changed into $x+1$ at each step. We have then

$$D\phi x=\Delta\phi x-\frac{1}{2}\Delta^2\phi x+\frac{1}{3}\Delta^3\phi x-\ldots.$$

a theorem which must be true if the preceding method be legitimate. This theorem is found to be true by other and certain modes of demonstration: consequently the legitimacy of the preceding method has some presumption in its favour, arising from its leading to an otherwise known truth.

In this way many theorems were investigated, upon the following plan of proceeding:—1. Throw away symbols of quantity from a known theorem, and proceed in any manner which may appear eligible with the symbols of operation, treating them as if they were quantities. 2. When a result has been obtained, restore the symbols of quantity to their old places, and those of operation to their old meanings. 3. The result as thus viewed has all the presumption in its favour which arises from its being the legitimate consequence of a method which, whether accurate or not, has never been found to lead to anything but what could otherwise be satisfactorily shown to be true. And though Lagrange himself, Arbogast, the English translators of Lacroix, Brinkley, &c. may have used language in reference to this method which would seem to imply that they considered it as one of demonstration, yet it is obvious, from the care taken by them to have abundant external verification in every case, that their results were considered by themselves as resting on such a presumption as that above noted; though it is also evident that they considered the presumption as amounting to moral certainty, which indeed they were justified in doing.

A student who reads on this subject for the first time, will be apt to let his ideas run farther than they should, and to imagine that this treatment of operations may be made universal. For instance, if $\phi x=x^2$ and $\psi x=x^3$, and if $\phi+\psi$ be taken as representing x^2+x^3, he might suppose that $\phi+\psi$ performed twice, or

$$(x^2+x^3)^2+(x^2+x^3)^3$$

represented by $(\phi+\psi)^2$, should be the same thing as

$$\phi^2+2\phi\psi+\psi^2, \text{ or } (x^2)^2+2(x^3)^2+(x^3)^3.$$

This however will be found not to be the case, and thus it appears that a line is to be drawn, distinguishing operations which may be used independently of quantities from those which may not. Until this line can be properly drawn, nothing like demonstration of the method, when true, can be given; or rather perhaps the converse, that is to say, a method of demonstration of such cases as give truths will draw the line which separates these from the rest. We proceed to give some account of this method of demonstration.

We do not know how far those who used the *separation of the symbols of operation and quantity* (as it was called) had before their minds those views which would have made their method intelligible in a rational point of view, which was all it wanted of mathematical exactness. But, looking only at their modes of expression, we cannot find anything of the kind. Lagrange (*Mém. Acad. Berlin*, 1772) gave only theorems without any mode of deducing them. Arbogast assumes the 'séparation des échelles' without remark. Laplace, by the aid of his theory of generating functions, must be held to have strictly demonstrated some isolated classes of the theorems which this method gives. But nothing like a general account of the reason why this separation of the symbols of operation and quantity leads to truth in certain cases and not in others, ever appeared, to our knowledge, before the publication of a memoir by M. Servois in the 5th volume of the 'Annales de Mathématiques,' (Lacroix, vol. iii., p. 726). The author exhibits those properties of the separable operations on which the legitimacy of the separation depends; and making a separate species of calculus of functions out of those properties, fully succeeds in demonstrating that differences, differentiations, and multiplications by any factors which are independent of the variables, may be used as if their symbols of operation were common algebraical quantities.

The last step was virtually made by Dr. Peacock, in his *Algebra* (1830); for though this work does not mention the subject, yet it is the first which lays down the principles on which the theory of separation is neither a resemblance of algebra, nor a calculus of functions founded on algebra, but *an algebra*, or if the reader pleases, algebra itself: so that its conclusions rest upon the same foundation as those of ordinary algebra.

We have [NEGATIVE AND IMPOSSIBLE QUANTITIES, p. 132, 133] pointed out what is meant by symbolical algebra, as distinguished from explained or interpreted algebra. Granting a certain number of fundamental relations, which are to be true, the logical consequences of combining those relations must be true also: thus, if it be universally true that $a+b=b+a$, and that $xy=yx$, it follows, even before a, b, $+$, x, xy, &c. have any meaning assigned, that $(a+b)z=z(a+b)=z(b+a)$. If, as in the article cited, we select all the primary relations on which algebraical transformations depend, and then bear in mind that the truth of all their consequences depends on the truth of those relations only, not on the relations being true for one meaning or another meaning of the symbols, but on the truth only of the relations, come how it may—we shall then see that all formulæ of algebra may be used as expressions of truths, whatever may be the meaning of the symbols employed, provided only that, such meanings being given, the fundamental relations are true. We have already seen that this may be carried the length of extending the meanings of all the symbols of algebra, in such manner that a science is created with definitions wide enough to include among its rational objects not only the negative quantity, but also its square root. This was *extension* only (p. 134); we shall now show a process which, though it is still extension, is of another character. It is remarkable that all the additions which have been made to the interpretations of algebra by modern writers have been pure extensions; that is to say, in no one instance has a new interpretation been given to a symbol of which the preceding ones were not particular cases. It yet remains to see whether a real alteration of interpretations is possible.

In our present inquiry, we need not trouble ourselves to make any particular consideration of the signs + and −,

They retain their algebraical meaning, so that whatever A and B may stand for, $+(+A) = +A$, $-(+A) = -A$, &c.

If we now ask, what are the fundamental symbolical relations of algebra which remain, after those which depend on $+$ and $-$ are taken away, we shall find them to be as follows:—1. The *distributive* character, as it is called, of the operation ab, with respect to $+$ and $-$, as shown in $a(b+c-e)=ab+ac-ae$. 2. The *commutative* or *convertible* character of the same operation with respect to others of the same kind and itself, as shown in $abc=acb=bca$, &c., and $ab=ba$. 3. The *depressible* character of operations of the species a^m, when performed upon other operations of the same kind, as shown in $a^m a^n = a^{m+n}$, $(a^m)^n = a^{mn}$. These laws of operation being granted, no matter what the nature of the interpretation under which it is found possible to grant them, all that is necessary to the mechanism of algebra will be found to have been granted. It will be remembered that we speak of $1 \div a$ under the symbol a^{-1}.

In arithmetic, as already seen, we may, if we please, consider the symbols 2, 3, &c., as indicative of operations performed upon the unit. Let us extend this notion, and, instead of the unit, make ϕx, any function of a variable x, the subject of operation; this function being always understood, if not expressed. Thus any symbol E has an operative meaning in itself, but when written in an equation stands for the result obtained by performing that operation upon ϕx, which may also be signified by E (ϕx). Also let $E+F$ and $E-F$ stand for the algebraical sum and difference of the results of the operations E and F performed upon ϕx. Let us now appropriate E to stand for the simple operation of changing x into $x+h$, or $x+$ any quantity independent of x in value: and to distinguish the different increments, let E_h, E_k, &c. denote the operations of changing x into $x+h$, $x+k$, &c. It is then very easily shown that E possesses the distributive, convertible, and depressible characters essential to its being logically the object of algebraical transformation. Take two functions, ϕx and ψx, either assumed independently or resulting from preceding operations: it follows then that $E_h(\phi x \pm \psi x)$ is $\phi(x+h) \pm \psi(x+h)$, which is $E_h \phi x \pm E_h \psi x$: or the distributive character is established. Again, consider $E_h(E_k \phi x)$ and $E_k(E_h \phi x)$: first, $E_k \phi x$ means $\phi(x+k)$, on which perform E_h, or change x into $x+h$, giving $\phi(x+h+k)$; next, $E_h \phi x$ is $\phi(x+h)$, on which E_k being performed, gives $\phi(x+k+h)$, the same as $\phi(x+h+k)$. Consequently $E_k E_h \phi x = E_h E_k \phi x$, or the convertible character of E is established. Thirdly, consider $E_h^3 E_h^2$, meaning that the operation E_h having been twice performed, E_h is to be three times performed upon the result: we have evidently $\phi(x+5h)$, or $E_h^5 \phi x$; and if E_h^3 were to be performed four times running, we should have E_h^{12}. Hence the depressible character of the successive operations is established: and, though it is a wide step for the beginner to make, the applicability of all the formulæ of algebra is now proved, subject, as in common algebra, to difficulties of interpretation occurring in results.

A simplification of the preceding notation may be made as follows: if E or E^1 be simply a direction to increase x by unity, and E^0 a direction to let it remain unaltered, it is clear that EE ϕx must mean $\phi(x+1+1)$, or $E_2 \phi x$; so that $E^2 \phi x$ and $E_2 \phi x$ are the same. Similar reasoning applies to E_h whenever h is a whole number; and shows that it is E^h and nothing else. Similar reasoning also applies to E^{-h} where h is a whole number: for E^{-h} must be so interpreted that E^h performed upon it may give E^{h-h} or E^0; that is $E^{-h} \phi x$ with x changed h times into $x+1$ must be $E^0 \phi x$, or ϕx; or $E^{-h} \phi x$ must be $\phi(x-h)$. In like manner it may easily be shown that *one of the meanings* of $E^h \phi x$, where h is fractional, is $\phi(x+h)$: but, as in common algebra, of which all the conclusions, as shown, here apply, when h is a fraction, E^h may be any one out of operations as many in number as there are units in the denominator of h. To take a very simple case, required $E^{\frac{1}{2}} \phi(x)$, meaning an operation which, twice repeated, gives $E^h \phi x$, or $\phi(x+h)$. This condition is evidently satisfied by $\phi(x+\frac{1}{2}h)$, but it is also satisfied by $-\phi(x+\frac{1}{2}h)$, for if part of the operation consist in change of sign, two repetitions of the operation reproduce the original sign.

It must not be forgotten that, in finding new objects of algebraical reasoning, we have not lost our rights over the old ones; thus any letter may stand for a multiplier or divisor of the universal subject of calculation, ϕx. *But these independent multipliers must not contain x*: for if they did contain x, the convertibility of the multipliers with E would not any longer be practicable. If, for instance, we consider $a\,E\phi x$, which is $a\,\phi(x+1)$, we find it to be the same as E $(a\phi x)$, for a, being independent of x, is not affected by E. But if we consider $xE\phi x$, and E $(x\phi x)$, we find the first to be $x\phi(x+1)$, and the second to be $(x+1)\,\phi(x+1)$.

To generalise the preceding, we may suppose $E^0 \phi x$ to mean ϕx as before, and $E\phi x$ to stand for $\phi(x+a)$, where a may have any value we please independent of x. And it is in our power to abbreviate any collection of operations by using a single symbol to stand for it. Thus Laplace uses $\nabla \phi x$ to stand for such a set of operations as

$$A_0\,\phi(x) + A_1\,\phi(x+a) + A_2\,\phi(x+2a) + \ldots.$$

which we should denote by

$$\nabla = A_0 + A_1\,E + A_2\,E^2 + \ldots..$$

Again, if in common algebra fy were $A_0 + A_1\,y + \ldots$, we might abbreviate the preceding into fE instead of ∇.

But it may be said that this, though intelligible as to a simple operation E, its repetitions E^2, E^3, &c., its inverse and repetitions of it E^{-1}, E^{-2}, &c., ceases to have meaning when we come to apply it to other functions of algebra. What, for instance, is log. $(1+E)$? How can the direction to add $\phi(x+a)$ to ϕx have a logarithm? This question arises from the student having carried with him into purely symbolical algebra (in which it is the first requisite to drop all meanings) significations of symbols derived from ordinary arithmetical algebra. Now it is to be remembered that as far as we have yet gone, all the transcendental symbols of algebra, a^E, log E, sin E, cos E, &c. have not been mentioned, far less defined; they are not therefore absurd, but only, for the present, unmeaning. The question is, how are we to give them meaning; at our pleasure, or by deduction? Evidently the latter, for we are bound to retain the power of using algebraical transformations as they now exist. Since then a^x in common algebra is equivalent to $1 + \log a.\,x + \frac{1}{2}(\log a.)^2\,x^2 + \ldots\ldots$ we must lay it down that $a^E = 1 + \log a.\,E + \ldots.$, or that a^E must be viewed, when it means an operation to be performed upon ϕx, as an abridgement of

$$\phi x + \log a.\,E\phi x + \tfrac{1}{2}(\log a.)^2\,E^2\phi x + \ldots.$$

This is unquestionably the most difficult step of the whole: we shall have occasion further to consider it in the article RELATION, but for the present the following may be sufficient. Since the total operation $A_0 + A_1\,E + A_2\,E^2 + \ldots$ can be easily understood, consisting merely of the successive performance of the operation E, the multiplication of the results by given quantities of common algebra, and the addition of the products; and since all the transcendentals of common algebra can be expanded in series of the above form, in such manner that the series have all the algebraical properties of the transcendentals they stand for; let us consider the transcendental symbols of operation as abbreviations of the series, supposed to stand for series of operations.

We shall now proceed to some examples. First, let it be required to transform the series $A_0\,\phi x + A_1\,\phi(x+a) + A_2\,\phi(x+2a) + \ldots.$ This may be represented by $A_0 + A_1\,E + A_2\,E^2 + \ldots$ performed upon ϕx. Let the latter series in common algebra be fE, then fE, considered as a symbol of operation, stands for the preceding complex operation. Let the transformation be required to be made into a series of terms containing ϕx and its differences: let $\phi(x+a) - \phi x = \Delta\phi x$, then $E-1$ is Δ, or $E = 1+\Delta$. But fE or $f(1+\Delta)$ is $B_0 + B_1\,\Delta + B_2\,\Delta^2 + \ldots$, where B_0, B_1, &c. are the values of fy and its successive differential coefficients when $y=0$, divided by 1, 1, 1.2, 1.2.3, &c. Consequently the preceding series is the same as

$B_0\phi x + B_1\Delta\phi x + B_2\Delta^2\phi x + \ldots$ For instance, let the series be $\phi x - \phi(x+a) + \phi(x+2a)\ldots$ or $(1-E+E^2-\ldots)\phi x$ or $(1+E)^{-1}\phi x$. Write $1+\Delta$ for E, and we have $(2+\Delta)^{-1}\phi x$ or

$$\left(\frac{1}{2}-\frac{1}{4}\Delta+\frac{1}{8}\Delta^2-\ldots\right)\phi x, \text{ or}$$

$$\frac{1}{2}\phi x-\frac{1}{4}\Delta\phi x+\frac{1}{8}\Delta^2\phi x-\ldots$$

We have chosen this result as one which is very easy to verify. Let ϕx, $\phi(x+a)$, &c., be denoted by X_0, X_1, &c., then [DIFFERENCES] we have

$$\phi x = X_0,\ \Delta\phi x = X_1 - X_0,\ \Delta^2\phi x = X_2 - 2X_1 + X_0,$$
$$\Delta^3\phi x = X_3 - 3X_2 + 3X_1 - X_0, \text{ \&c.}$$

Substitute these in $\frac{1}{2}\phi x - \frac{1}{4}\Delta\phi x + \ldots$, and we have $\frac{1}{2}X_0 - \frac{1}{4}(X_1 - X_0) + \ldots$: take a few terms, developing the fractional multiplication, and we shall find the preceding to be identical with

$$\left(\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots\right)X_0-\left(\frac{1}{4}+\frac{2}{8}+\frac{3}{16}+\ldots\right)X_1+$$
$$\left(\frac{1}{8}+\frac{3}{16}+\frac{6}{32}+\ldots\right)X_2-\ldots \text{ or}$$
$$\frac{1}{2}\left(1-\frac{1}{2}\right)^{-1}X_0-\frac{1}{4}\left(1-\frac{1}{2}\right)^{-2}X_1+\frac{1}{8}\left(1-\frac{1}{2}\right)^{-3}X_2-$$

or $X_0 - X_1 + X_2 - \ldots$ or $\phi x - \phi(x+a) + \phi(x+2a) - \ldots$

We shall now take an example of interpretation. Required the meaning of Δ^{-1} by means of E? Since $\Delta = E-1$, we have $\Delta^{-1} = (E-1)^{-1} = E^{-1} + E^{-2} + E^{-3} + \ldots$ or

$\Delta^{-1}\phi x$ means $\phi(x-a) + \phi(x-2a) + \ldots$ *ad infinitum.*

This is easily shown to be consistent with the relation $\Delta\Delta^{-1} = 1$ or $\Delta\Delta^{-1}\phi x = \phi x$, for if the preceding series be called ψx, we have $\Delta\Delta^{-1}\phi x = \Delta\psi x = \psi(x+a) - \psi x = (\phi x + \phi(x-a) + \ldots) - (\phi(x-a) + \phi(x-2a) + \ldots) = \phi x$.

As yet we have nothing which might not have been done with tolerable ease by common methods, nor shall we have done more in proving Taylor's Theorem, but the step which we shall make to follow that proof will be an instance of the deduction of a theorem which is of a more difficult character.

Let $(\phi(x+\theta) - \phi x) : \theta$ be called D_θ: then the smaller θ becomes, the more nearly is $D_\theta\phi x$ the differential coefficient of ϕx, or $\phi' x$. Let θ be the nth part of the given quantity a: then the smaller θ is, the greater must n be. We have then

$$\phi(x+\theta) = (1+\theta D_\theta)\phi x,$$
$$\phi(x+2\theta) = (1+\theta D_\theta)^2\phi x, \text{ since}$$
$$\phi(x+2\theta)-\phi(x+\theta) = \theta D_\theta\phi(x+\theta) \text{ or}$$
$$\phi(x+2\theta) = (1+\theta D_\theta)\phi(x+\theta) = (1+\theta D_\theta)^2\phi x.$$

Proceeding in this way we obtain $\phi(x+n\theta)$ or $\phi(x+a)$

$$= (1+\theta D_\theta)^n\phi x = \phi x + n\theta D_\theta\phi x + n\frac{n-1}{2}\theta^2 D_\theta^2\phi x + \ldots$$

For $n\theta$ write a, and the preceding becomes

$$\phi x + aD_\theta\phi x + a\frac{a-\theta}{2}D_\theta^2\phi x + \ldots$$

which being always $= \phi(x+a)$, has a limit also $= \phi(x+a)$. Take that limit by diminishing θ without limit, and we see that $D_\theta\phi x$, $D_\theta^2\phi x$, &c., become $\phi' x$, $\phi'' x$, &c., or

$$\phi(x+a) = \phi x + \phi' x . a + \phi'' x\frac{a^2}{2} + \ldots$$

which is Taylor's Theorem. Suppose we denote the operation of differentiation by D, and $\phi(x+a) - \phi x$ by $\Delta\phi x$, we have then

$$1+\Delta = 1 + aD + \frac{a^2}{2}D^2 + \ldots = \epsilon^{aD};$$

a particular case of which (when $a=1$) was chosen as our illustration at the beginning of this article. This relation $1+\Delta = \epsilon^{aD}$ gives us a very great power of converting series which contain differences into those containing differentials, and *vice versâ.*

We now propose to interpret D^{-1}. This symbol must satisfy $DD^{-1}\phi x = \phi x$, and $D^{-1}D\phi x = \phi x$, the first of which is satisfied by $D^{-1}\phi x = \int\phi x dx + C$, where C may have any constant value: but the second is only satisfied by $\int\phi x dx$, beginning at a value of x which makes $\phi x = 0$. We shall however see that we need not enter on this question in reference to the theorem immediately following.

Let it be required to express $\Delta^{-1}\phi x$, or $\phi(x-a) + \phi(x-2a) + \ldots$ ad inf., by means of operations of the differential and integral calculus. Since Δ is $\epsilon^{aD}-1$, we have to find $(\epsilon^{aD}-1)^{-1}$ expanded in powers* of D. Now common algebraical processes show that $(\epsilon^t - 1)^{-1}$ can be developed in the series

$$\frac{1}{t}-\frac{1}{2}+B_1\frac{t}{2}-B_3\frac{t^3}{2.3.4}+B_5\frac{t^5}{2.3.4.5.6}-\text{\&c.},$$

where B_1, B_3, B_5, &c, are the NUMBERS OF BERNOULLI,† of which an ample stock is given in the article cited: thus $B_1 = \frac{1}{6}$, $B_3 = \frac{1}{30}$, &c. Write aD for t, restoring ϕx, and for $D\phi x$, &c., write $\phi' x$, &c., but for $D^{-1}\phi x$, write $\int\phi x dx + C$. We have then

$$\phi(x-a)+\phi(x-2a)+\phi(x-3a)+\ldots \textit{ ad inf.}$$
$$= \frac{1}{a}\int\phi x dx + C - \frac{1}{2}\phi x + \frac{B_1 a}{2}\phi' x - \frac{B_3 a^3}{2.3.4}\phi''' x + \ldots$$

The determination of the constant might in many cases be troublesome, but if we only want a finite number of terms of the series, we can avoid it altogether as follows. Let $x - na = y$, and suppose that $\phi(x-a) + \ldots$ ending with $\phi(x-na)$ is sought. Write y instead of x in the preceding, remembering that $y - a = x - (n+1)a$, &c.: subtract the result thus obtained from the preceding, and we have

$$\phi(x-a)+\phi(x-2a)+\ldots+\phi(x-na)$$
$$= \frac{1}{a}\int\phi x dx - \frac{1}{a}\int\phi y dy - \frac{1}{2}(\phi x - \phi y) + \frac{B_1 a}{2}(\phi' x - \phi' y) - \ldots$$

But $\int\phi x dx - \int\phi y dy$ is $\int\phi x dx$ taken from y to x, or if $\phi_1 x$ differentiated give ϕx, it is $\phi_1 x - \phi_1 y$.

For further developments of the results of this subject, see the Appendix to the Translation of Lacroix; Herschel's 'Examples of the Calculus of Differences;' Lacroix's large work on the Differential Calculus, vol. iii.; 'Library of Useful Knowledge—Differential Calculus;' a paper by Mr. Murphy in the Phil. Trans. for 1837; and various papers in the numbers of the 'Cambridge Mathematical Journal.' In several of these works further references will be found. The student may make an attempt at the demonstration of the following theorem a test of his understanding the method which we have explained, and the points of analysis which are most essential as preliminaries. Whatever a may be, the differential coefficient of ϕx is an algebraical equivalent of the following series:

$$\frac{\phi(x+a)-\phi(x-a)}{a}-\frac{\phi(x+2a)-\phi(x-2a)}{2a}$$
$$+\frac{\phi(x+3a)-\phi(x-3a)}{3a}-\ldots$$

Instead of supposing ϕx, a function of x only, to be the fundamental subject of operations, we might make it $\phi(x, x_1)$ and suppose E and E′ to represent the operations of changing x into $x+a$ and x_1 into x_1+a_1.* We can only

* We transfer this word, with extension of meaning, to the calculus of operations.

† We have examined these numbers, and find them to contain no variation from the authorities cited.

briefly note some of the results of this extension. If D and $D_{\prime}$ represent the operations of differentiation with respect to x and to $x_{\prime}$, we have in

$$EE_{\prime} = \epsilon^{aD+a_{\prime}D_{\prime}} = 1 + (aD+a_{\prime}D_{\prime}) + \ldots .$$

the means of obtaining the common extension of Taylor's Theorem to a function of two variables. Again, if we take $\phi x \psi x$, and let D and $D_{\prime}$ represent operations of differentiation, which separately affect ϕx and ψx, we have in the development of $(D+D_{\prime})^n \phi x . \psi x$, the formula for forming the nth differential coefficient of the product.

Since writing the above, we have found in the collection of Abel's works (vol. ii., p. 7) a paper in which this subject is treated on a foundation which, though limited, is peculiar and elegant. It is a theory of generating functions, in which

$$\phi x \text{ being} = \int \epsilon^{xv} fv.\, dv,$$

the limits being fixed, f is called the *determinant* of ϕ. The legitimacy of the separations made in this article is very easily deduced.

OPERCULI'FERA, one of the families of Polypiaria Membranacea of Blainville, also called Escharicea. [POLYPIARIA MEMBRANACEA.]

OPERCULI'NA. [FORAMINIFERA, vol. x., p. 348.]

OPER'CULUM (Malacology). The plates or pieces which protect the apertures or exposed parts of certain mollusks. In many of the testaceous gastropods it becomes a cover or door, which fits the aperture of the shell more or less accurately when the animal has retired within it. *Opercula* of this kind vary much in structure and shape. Thus they are sometimes horny, as in Trochus and Murex; sometimes shelly, nay almost stony, as in Turbo; and in construction they are for the most part either spiral, concentric, or unguiculated. The *opercula* or opercular valves of the Cirrhipeds are figured and described in the articles BALANUS and CIRRIPEDA.

OPE'RCULUM. In Botany this term is chiefly used for the cap which forms the upper extremity of the theca, or sporangium, of a moss, covering over the peristome, and usually falling off when the spores are ready for dispersion. [MOSSES.] It has also been applied to the lid which covers in the Pitcher of Nepenthes, where it is the lobe of a modified leaf. [PITCHER PLANTS.]

OPHICLEIDE (ὄφις, *a serpent* or *snake*, and κλεὶς, *a key*), a musical instrument of the inflatile kind, made of brass or copper, and intended to supersede the Serpent—of which it is a decided improvement—in the orchestra and in military bands. It is a conical tube, the longest nearly nine feet in length, terminating in a bell, like the horn. It has ten ventages, or holes, all of which are stopped by keys, similar to those of the bassoon, only of larger dimensions, and is furnished with the same kind of mouth-piece as the Serpent. The scale of the base Ophicleide is from B, the third space below the base staff, to C, the fifth added space above it,—



including every tone and semitone within this compass. Music for the Ophicleide is written in the base clef; for the alto, or *ophicleide quint*, in the treble clef. When the two instruments play together, the music for the alto is written an octave higher than that for the base.

The Ophicleide is quite a new invention, ascribed to M. Halary. It was used in the military bands of the northern sovereigns, when the troops of the allies occupied Paris. M. Labbaye, a manufacturer of musical instruments in that city, added new keys to it, and otherwise much extended its capabilities; besides which, he discovered a better mode of constructing the tube than had been practised, and thus greatly ameliorated its tone. These improvements were reported to the French Society of Arts in 1821, by M. Francœur, in consequence of which Labbaye obtained a patent for five years The Ophicleide first reached England in 1834, one of extraordinary dimensions having been manufactured abroad for the Birmingham Musical Festival of that year. In the *Supplement* to the *Musical Library* for November, 1834, it is thus mentioned:—'A new instrument, the *Double-Base Ophicleide*, made for this festival, and now first introduced into England, proved eminently serviceable in the choruses, and whenever strength was required. The volume of sound it emits is immense, but the tone is rich, round, and blends well with the voices. We are much deceived if this instrument is not destined to operate a great change in the constitution of our orchestras: well played, it will answer the purpose of four double-bases, and is well calculated to form a third part to the bassoons, which has long been a desideratum. As a contra-basso to the trombones, it will not be found less useful.' This prognostic has proved correct; the instrument is now become indispensable.

OPHIDIANS. [SERPENTS.]

OPHIO'DES, Wagler's name for a genus of *Scincoidean Lizards* (*Pygopus*, Spix; *Bipes*, part. Cuvier; and *Pygodactylus*, Fitzinger and Wagler—according to MM. Duméril and Bibron). [SCINCOIDEANS.]

OPHIO'MORUS, a genus established by MM. Duméril and Bibron for a form placed by them in their first subfamily (*Saurophthalmes*) of *Scincoidean Lizards*.

Generic Character.—Nostrils lateral, each opening between two plates, viz. the nasal and superonasal. Tongue flat, arrow-headed in shape, scaly, and slightly notched at the point. Teeth conical, obtuse, and erect. Palate not toothed, and with a longitudinal groove. Body anguiform. Tail long, rounded, and pointed. Scales smooth.

This genus is distinguished from the *Orvets* (*Anguidæ*), 1st, by their teeth, which are not so long in proportion, nor so slender, neither are they directed backwards; 2nd, by the tongue, which is hardly notched at the point, and only offers a transverse furrow near its anterior extremity. It is furnished with only one sort of papillæ over its whole surface, and they are flattened and imbricated from before backwards like scales; 3rd, by their nostrils, which do not terminate in the middle of a small plate, but between the nasal and superonasal, which are rather large. There is a *meatus auditorius*, but as small and as difficult to perceive as that of the *Orvets*.

Example, *Ophiomorus miliaris*. Total length 15″. Yellow above, grey at the sides, lower parts whitish with many rows of very small black points; those on the sides being generally more dilated and thicker together than those on the back and belly.

Localities.—The Morea and 'Algérie' (Duméril and Bibron, who add however that they know that this form, like many other Herpetological productions of those countries, is found in South Russia, where it was observed by Pallas).

OPHIOPHTHALMES, the name assigned by MM. Duméril and Bibron to their second subfamily of *Scincoidean Lizards*, having all naked eyes, but only one of them (*Gymnophthalmus quadrilineatus*) being completely without the eyelid. In the others there exists a rudiment surrounding the orbit either entirely or in part, under the form of a ring or demi-ring, often very narrow and immoveable, sometimes rather enlarged at the upper part, and susceptible of being folded back under the orbital border, or of advancing a little upon the eye-ball, as in some species of *Ablepharus*. The genera placed by the authors above quoted under the *Ophiophthalminæ* are few, and the species not numerous. The former are *Ablepharus*, *Gymnophthalmus*, *Lerista*, *Hysteropus*, and *Lialis*.

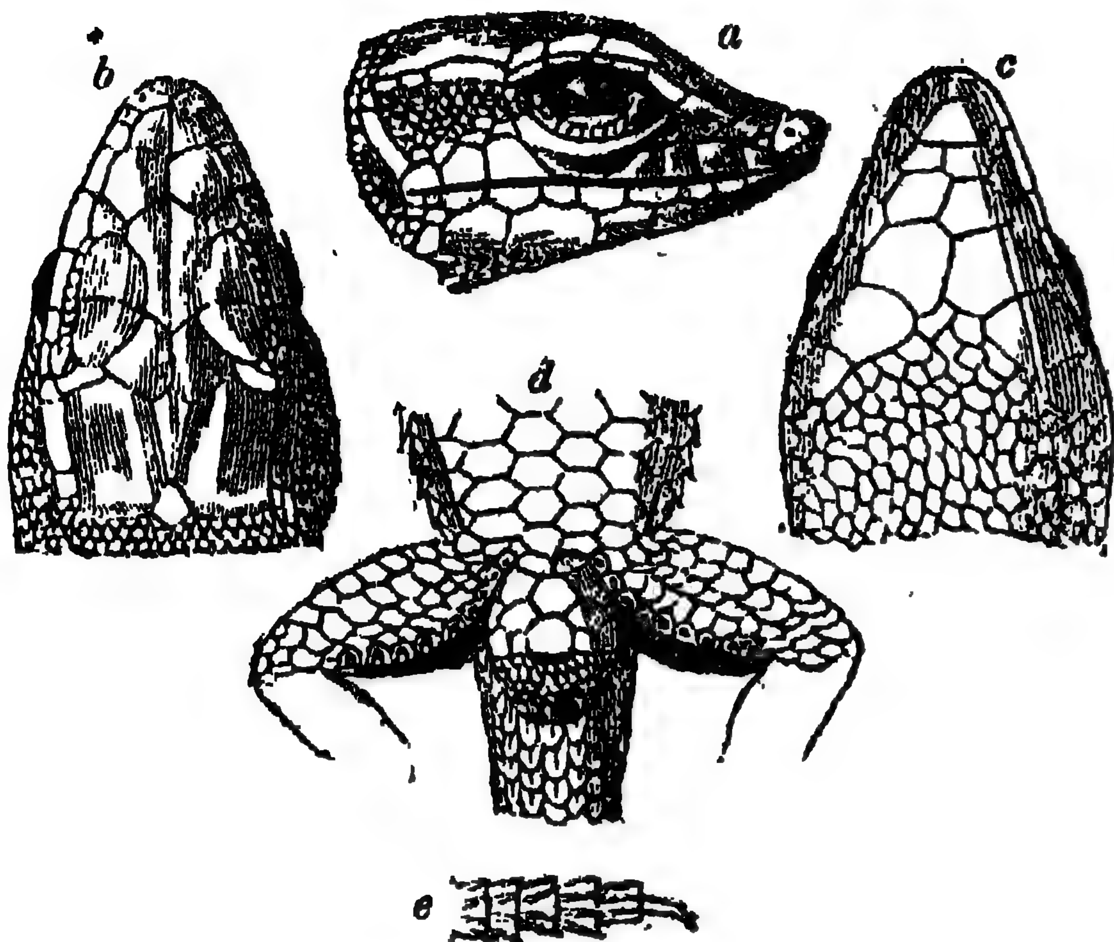
O'PHIOPS, a name given by M. Ménestriés to a genus of Lacertians (*Pristidactyle Calodonte* of Duméril and Bibron, *Amystes* of Wiegmann).

Generic Character.—Tongue arrow-headed in shape, moderately long, notched at the end, covered with imbricated squamiform papillæ. Intermaxillary teeth conical, simple. Maxillary teeth rather compressed, the anterior simple, the posterior tricuspidate. Two slightly convex naso-rostral plates, between which is opened the nostril situated on the line of the *canthus rostralis*. No eyelids. A tympanic membrane extended within the auricular opening. No scaly collar under the neck. A small fold in front of each shoulder. Ventral *lamellæ* quadrilateral, smooth, and disposed quincuncially. Femoral pores. Feet with five toes slightly compressed, carinated below, but not dentilated laterally. Tail cyclotetragonal at its root, but rounded throughout the rest of its length.

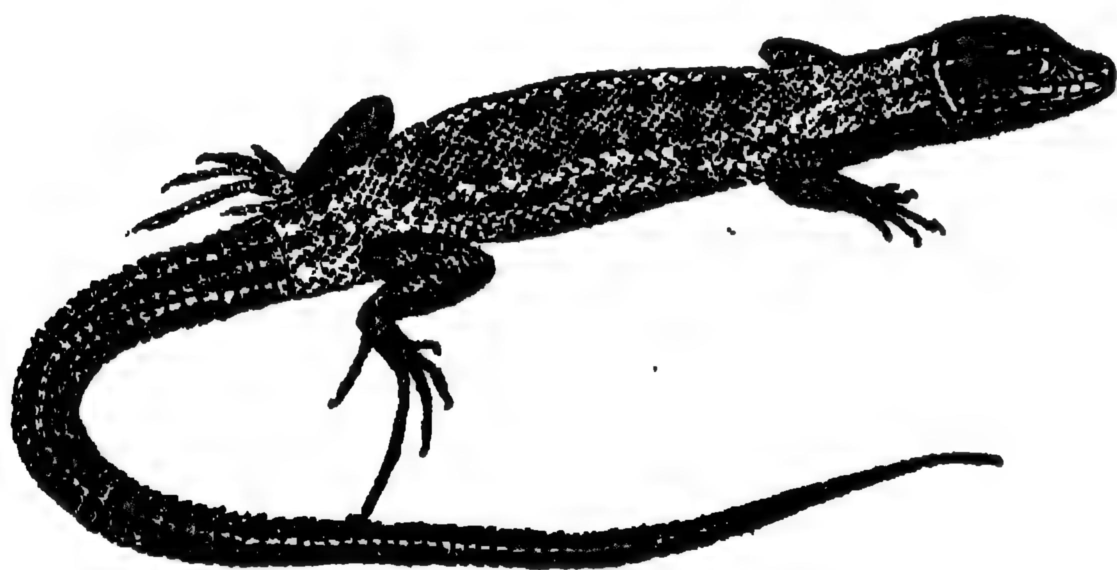
MM. Duméril and Bibron remark that the principal character of this genus is the absence of eyelids, a conformation which distinguishes it from all the other known *Pristidactyle Cœlodonts*.

Example, *Ophiops elegans* (Mén.)—*Amystes Ehrenbergii*. Wiegm. Olive or bronzed above. Two yellowish lines extend along each side of the trunk; each of these yellowish or whitish lines separates two rows of black spots, which are small and very distinct in young individuals, but are more or less dilated and confused in adults. White below.

Locality.—Smyrna; Bakou.



a, head of Ophiops (profile); *b*, same, seen from above; *c*, throat and lower jaw; *d*, lower part of the body, interior surface of the thighs, &c.; *e*, under side of a posterior toe.



Ophiops elegans.

OPHIR (אוֹפִיר), a place which was known to the Hebrews and to the neighbouring nations, as early as the time of Job, as producing such an abundance of excellent gold, that 'the gold of Ophir' became a proverbial expression for fine gold. (1 *Chron*. xxix. 4; *Job*, xxii. 24; xxviii. 16; *Psalms*, xlv. 9; *Isaiah*, xiii. 12.) The position of this place is very difficult to determine. We are informed that Solomon, in conjunction with Hiram, king of Tyre, sent a navy from Ezion-geber, at the head of the Red Sea, to Ophir, and that this navy returned bringing four hundred and twenty (in *Chronicles* 450) talents of gold, sandal-wood (called in our translation almug or algum trees), and precious stones (1 *Kings*, ix. 26-28; x. 11, compared with 2 *Chron*. viii. 17-18; ix. 10): and also that Jehoshaphat built ships of Tarshish to go to Ophir for gold (in *Chronicles* it is said that he built ships *to go to Tarshish*), which were wrecked at Ezion-geber. (1 *Kings*, xxii. 48, 49, compared with 2 *Chron*. xx. 36, 37.) We are also told in 1 *Kings*, x. 22, that Solomon had at sea a navy of Tarshish with the navy of Hiram; once in three years (or every third year) came the navy of Tarshish, bringing gold and silver, ivory, and apes, and peacocks.

Now since both Solomon and Jehoshaphat built the navies bound for Ophir at Ezion-geber, at the head of the Red Sea, it is clear that we must seek for Ophir somewhere on the shores of the Indian Ocean, for it is highly improbable that Solomon's ships went farther than the Cape of Good Hope in one direction, or than the Indian Archipelago in the other: it is not likely indeed that they went so far either way. Nearly all the inquiries into the position of this place have proceeded on the assumption that the passage in 1 *Kings*, x. 22, refers to the same navy which is spoken of in 1 *Kings*, ix. 27, 28, &c., and consequently that Tarshish and Ophir were visited in the same voyage. It has therefore been necessary for those who make this assumption not only to find a place which suits the description of Ophir, and which produces 'gold, sandal-wood, and precious stones,' but also to account for the 'silver, ivory, apes, and peacocks,' which were brought by the navy of Tarshish, and for the three years consumed in the voyage. But Tarshish was probably the same place as Tartessus in Spain, and therefore, if Tarshish and Ophir are to be connected, we must make the gratuitous supposition that there was another Tarshish in the East. [TARSHISH.] Besides, Tarshish and Ophir are not mentioned together in the account of Solomon's voyages; the ships that went to Ophir (1 *Kings*, ix. 28) seem to have made only a single voyage for the purpose of fetching a specified quantity of gold, while the 'navy of Tarshish' which 'the king had' (not going to Ophir, but) 'at sea' made its voyage every three years; and moreover the products of the voyages were different, gold being the only article common to the two. For these reasons we think Major Rennell correct in saying 'that two distinct kinds of voyages were performed by these fleets: that to Ophir from the Red Sea; and that to the coast of Guinea' (or to Tarshish, wherever it was) 'from the Mediterranean.' (Rennell's *Geography of Herodotus*, vol. ii., p. 353.) The conjoint mention of Ophir and Tarshish in the account of Jehoshaphat's navy admits of easy explanation; either there may be some mistake in the account in 2 *Chron*. xx. 36, 37, which differs materially from that in 1 *Kings*, xxii. 48, 49, or 'Tarshish' in the former passage may mean only 'a distant voyage,' and we know that the phrase in the latter passage, 'ships of Tarshish,' is frequently used in the Old Testament for large strong ships. The question therefore as to the position of Ophir must not be encumbered with any considerations that refer to Tarshish. The principal conjectures on the subject are the following:—

1. That Ophir was in India. This was the opinion of Josephus. (*Antiq*., viii. 6. 4.) A town Σουπάρα (the Οὔππαρα of Arrian), at or near Goa, is mentioned by Ptolemy, Ammianus, and Abulfeda; and Sophir was the antient Egyptian name of India. The Septuagint translates Ophir by Σωφίρ, Σωφίρ, Σωφάρα, and similar words. This opinion is held by Vitringa, Reland, and others.

2. John dos Sanctos (a Portuguese friar quoted in Purchas's 'Pilgrims'), who is followed by Bruce, D'Anville, and Robertson, places Ophir at Sofala, on the eastern coast of Africa, opposite Madagascar, chiefly on the ground of a supposed resemblance in the name.

3. Some place it on the Persian Gulf, but on very insufficient grounds.

4. The most probable opinion is, that Ophir was in the south of Arabia. It is mentioned in connection with the names of Arabian tribes in *Gen*. x. 29. The 'gold of Ophir' is mentioned in the book of *Job*, which is most probably of Arabian origin. The products of the voyage might easily have been obtained from Arabia, for though gold is not found there now, we have the testimony of several antient writers that it was in antient times. It is however very probable that Ophir was an emporium of the Phœnicians for their eastern trade; if so, the difficulty as to the productions is removed. This opinion is held by Michaelis, Gosselin, Vincent, Rosenmüller, and most modern historians.

(Gesenius's *Hebrew Lexicon*; Winer's *Biblisches Realwörterbuch*; *Pictorial Bible*, vol. ii., p. 347, 364.) [ARABIA, vol. ii., p. 214; HINDUSTAN, vol. xii., p. 222.]

OPHISAURUS, Daudin's name for a genus of reptiles (*Hyalinus* of Merrem) nearly allied to the Scheltopusiks (*Pseudopus*, Merrem), and, according to Cuvier, one of the subgenera of the *Anguidæ*. [BLINDWORM, vol. iv., p. 528.] The genus is placed by MM. Duméril and Bibron among the *Ptychopleures* the first subfamily of their *Chalcidian Lizards*.

Generic Character.—Tongue arrow-headed in shape, notched triangularly in front, free for one-third of its extent anteriorly, which part has granular papillæ, whilst the other two posterior thirds exhibit filiform papillæ. Many rows of palatal teeth. Intermaxillary teeth conical. Maxillary teeth subcylindrical, simple. Nostrils lateral, each with its opening in a single plate. External orifice of the ear very small. Eyelids; cephalic plates numerous. Body serpentiform. No vestige of limbs externally. Two rather

deep lateral furrows. No fold across the lower surface of the neck.

This form is one of those transitions by which nature passes from one type to another. The animal, in effect, has the head of a Lizard on a serpentine body. There appears to be but one species, viz. ***Anguis ventralis***, Linn.; *The Glass Snake*, ***Cæcilia maculata***, Catesby.

Description.—Colour yellowish green, spotted with black above. Tail longer than the body. Head very small, and the tongue of a singular form, according to Catesby.

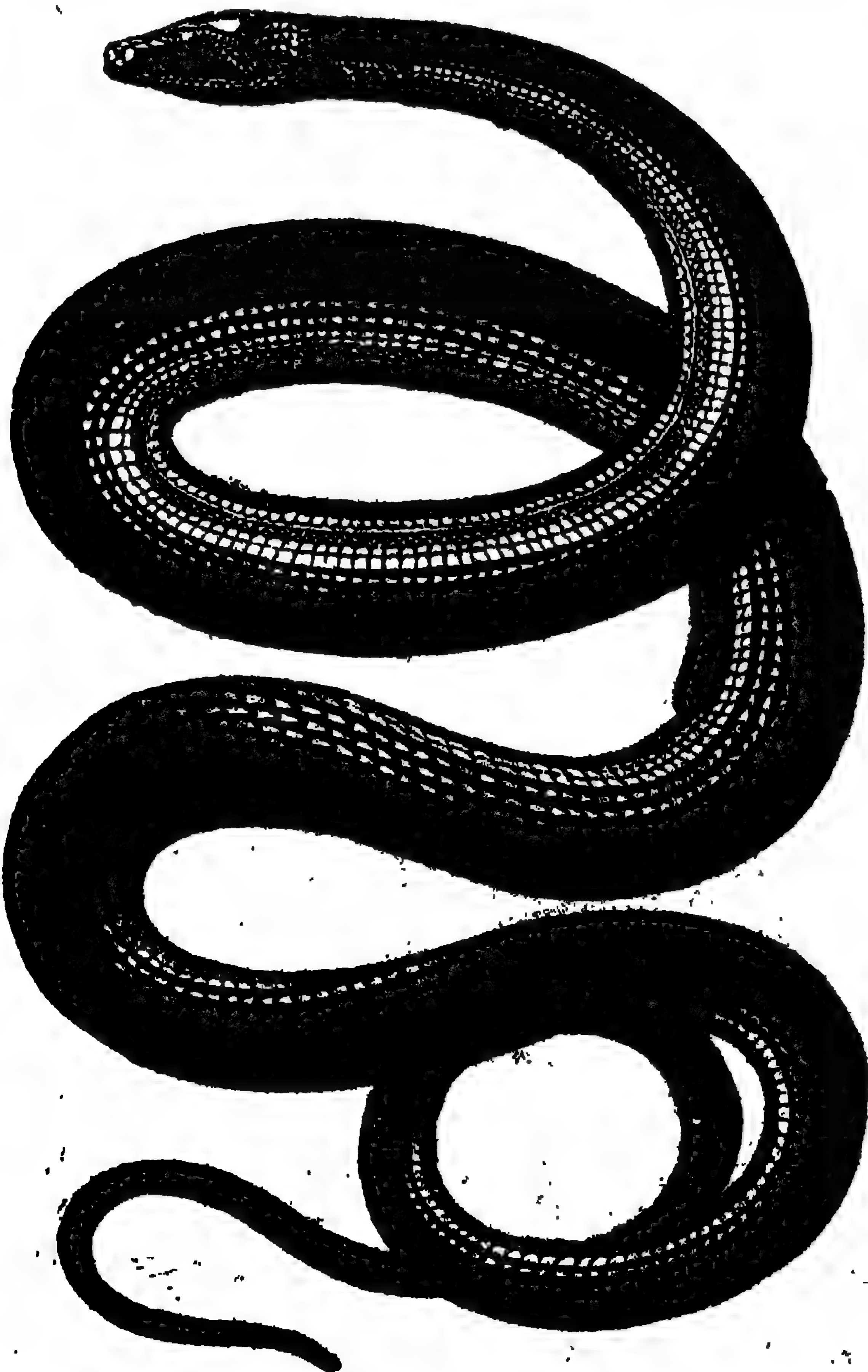


a, Head of Ophisaurus ventralis; *b*, head of the same from Catesby, showing the tongue.

It is probable that this species is subject to slight variations of colour. Catesby says that the 'upper part of the body is of a colour blended brown and green, most regularly and elegantly spotted with yellow; the belly yellow, the undermost part of which is brightest. Their skin is very smooth and shining, with smaller scales more closely connected, and of a different structure from other serpents.' General length about eighteen inches.

The fragility of this animal equals if it does not exceed that of the Blindworm; and hence, probably, its name of *Serpent de Verre*, or *Glass Snake*. The author last quoted says, 'a small blow with a stick will cause the body to separate, not only at the place struck, but at two or three other places; the muscles being articulated in a singular manner, quite through to the vertebræ. They are generally said to be harmless.' There is no doubt that the species is innocuous.

Geographical Distribution. — The Southern United States. Catesby states that the Glass Snakes appear earlier in the spring than any other serpent, and that they are numerous in the sandy woods of Virginia and Carolina.



Ophisaurus ventralis.

OPHIU'CHUS (the Serpent-bearer), one of the old constellations, representing a man holding a serpent, which is twined about him. But the moderns make a separate constellation of the serpent. [Serpens.] Ophiuchus has also been called Anguitenens and Serpentarius. The figure of the man rests his feet upon the back of Scorpius, and is surrounded by Scorpius, Libra, Bootes, Corona, Hercules, and Aquila. It is not a constellation of any note, containing no star of the first, and one only of the second magnitude. The number and insignificance of the mythological traditions connected with it are rendered less surprising by this paucity of remarkable stars, since the latter is a presumption that the constellation itself is of a later date than Orion or Ursa Major.

The following is a list of the principal stars: it will be observed that the letters *o*, *p*, *q*, and *r*, have been given twice; the second is in all three cases the star so designated by Flamsteed.

Character. (Not in Bayer.)	No. in Catalogue of		Magnitude.	Character. (Not in Bayer.)	No. in Catalogue of		Magnitude.
	Flamsteed. (Piazzi.)	Astron. Society.			Flamsteed. (Piazzi.) [Bradley.]	Astron. Society.	
δ	1	1859	3	σ	49	2000	5
ε	2	1869	3½	e‡	51	2005	6
υ	3	1884	5		52	2011	6
ψ	4	1874	5	f	53	2015	6
(ρ)*	5	1877	5		54	2014	6
χ	7	1882	6	α	55	2017	2
φ	8	1891	4	μ	57	2021	6
ω	9	1893	5	(D)§	58	2032	6
λ	10	1894	4	β	60	2036	3
	12	1901	6	γ	62	2045	4
ζ	13	1902	3	(z)	63	2049	5
(l)	16	1912	6	ν	‡‡64	2055	4
(u)	18	1917	6½	(n)	66	2064	4½
(r)	20	1920	5½	o	67	2066	4
	21	1923	6	(k)	68	2072	4
	22	1928	7	τ	69	2075	5
(q)	23	1931	5½	(p)	70	2082	4
	24	1936	7	(S¹)	71	2089	6
ι	25	1932	4	(S²)	72	2090	4
(x)	26	1941	6	(q)	73	2092	6
κ	27	1940	4	(r)	74	2108	6
	28	1946	6		(33)	1974	6
(s)	29	1944	6		(43)	1979	6½
(p)	30	1945	6		(90)	1995	6½
	32	1953	6		(99)	1998	5½
	34	1955	6		(112)	2004	6
η	35	1961	3	h	(127)	2008	6
A	36‖	1967	5½		(195)	2033	7
	37¶	1966	6		(203)	2034	6
o	39	1973	6		(232)	1934	6
ξ†	40	1981	4		(248)	1939	6
(o)	41	1975	4½		(251)	1942	7
θ	42**	1986	3½		(277)	1951	6
(y)	43	1988	6		(289)	1956	6
b	44	1993	5		(297)	1958	6½
d	45††	1994	6		(303)	1959	6
	47	1997	6		[2070]	1865	6

OPHIU'RA, Lamarck's name for a genus of Star-fishes. M. de Blainville makes it the first genus (*Euryale* being the other) of his *Asterophydea*, or more correctly, *Asterophidia*, the second family of his *Stelleridea* (*Asterias*, Linn.)

ASTEROPHIDIA.

Body small, disciform, very much flattened, the circumference furnished with appendages more or less elongated, serpentiform, squamous, and without inferior furrows.

The organization of this family differs in many points

* ρ of Flamsteed.
† Erroneously called ρ by Flamsteed.
‡ Called e by Flamsteed, but probably d of Bayer.
§ This letter was given because Flamsteed had erroneously supposed it to be d of Bayer.
‖ Neither this nor any other star agrees with A in Bayer's map.
¶ Flamsteed's 38 Ophiuchi is also his 31 Scorpii.
** Does not agree with Bayer.
†† 46 Ophiuchi of Flamsteed does not exist, but is an error of computation.
‡‡ 65 of Flamsteed was either a mistake or has disappeared.

from that of the true *Asteriæ;* and there is also a difference in their habits.

Ophiura.

Body discoid, depressed, rather small, subquinquelobate, covered with a coriaceous skin, and provided at its circumference with five simple, very long, very slender, squamous rays, without any trace of an inferior furrow, but always accompanied laterally with spines more or less moveable, and with two rows only of large cirrhi, or suckers, one on each side below.

Mouth in the midst of five very short slits, not exceeding the demi-diameter of the body, and furnished with a few papilliform suckers (eight), and on the edges with five groups of scales, which are often dentiform.

Orifices of the ovaries very large, in the shape of a slit on each side of the root of the rays.

No madreporiform tubercle. (Blainv.)

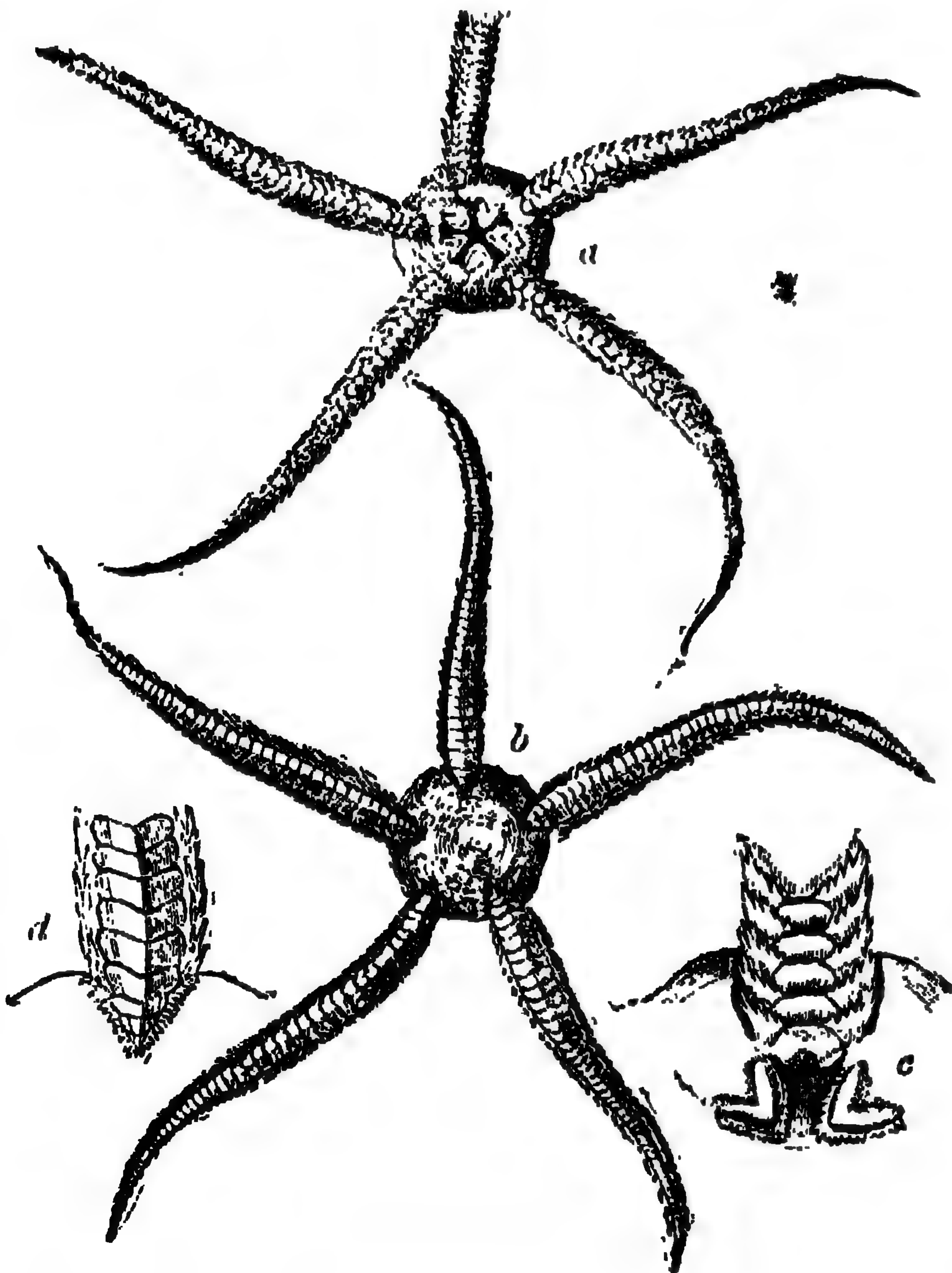
a.

Species the spines of whose rays are very short and applied (appliquées).

Example, *Ophiura texturata.* (*Stella lacertosa*, Link.)

Description.—Brownish or brownish white; rays smoothly subulate; the scales on the lower surface disposed trifariously; the papillæ of the sides very small and adpressed.

Geographical Distribution.—The European Seas. Lamarck adds the Atlantic Ocean. It was taken very abundantly in the trawl in Davis's Strait in Sir Edward Parry's first voyage; and occurs on the British coasts.



Ophiura texturata.

a, front; b, back; c, portion of centre and arm magnified (front); d, the same (back).

β.

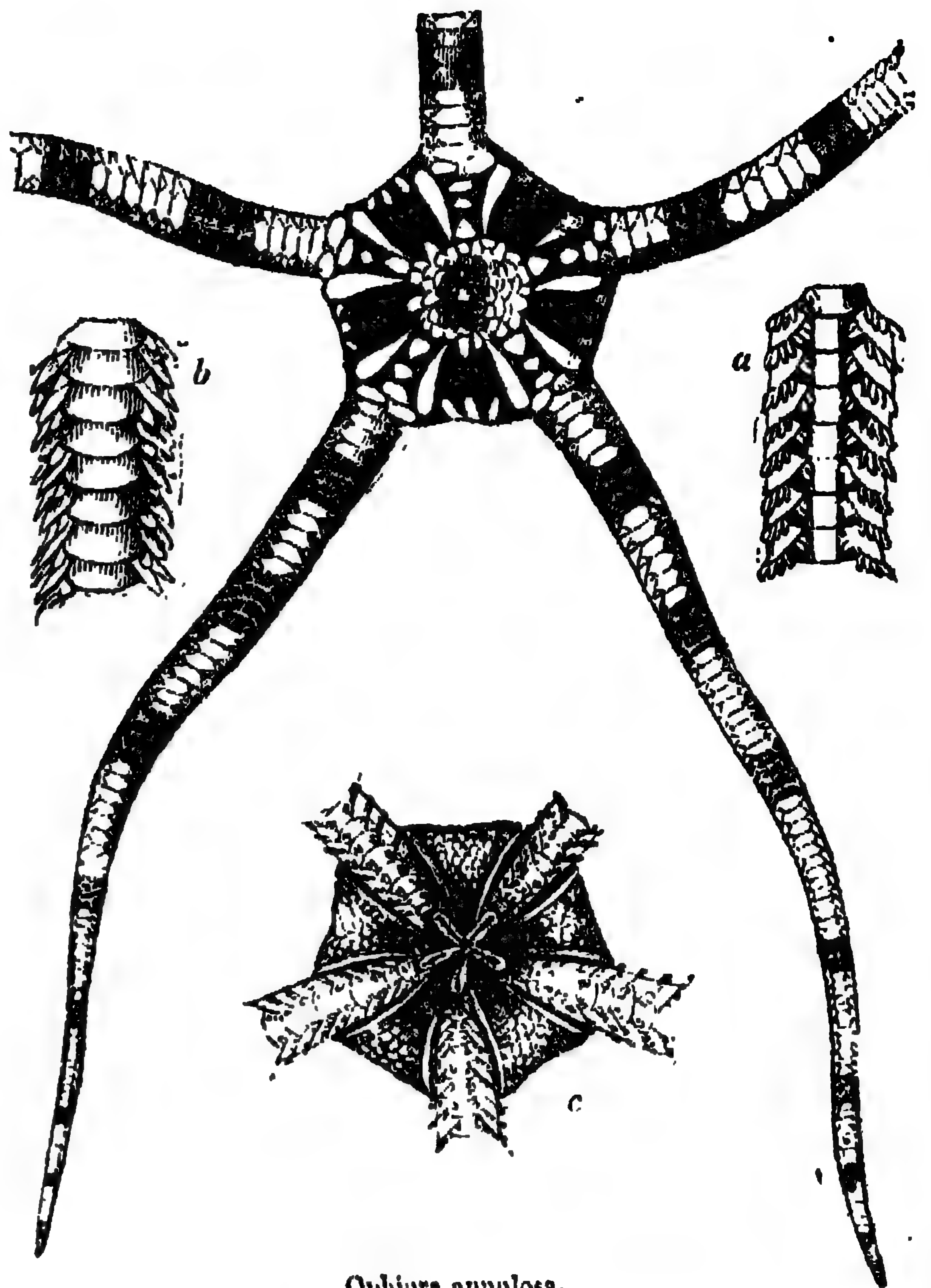
Species the spines of whose rays are long, and not applied.

Examples, *Ophiura annulosa* and *Ophiura granulata.*

Ophiura annulosa.

Description.—Brownish, rays long, smoothly subulate, spinous at the sides, the spines annulose, and subadpressed; back of the disk echinulate.

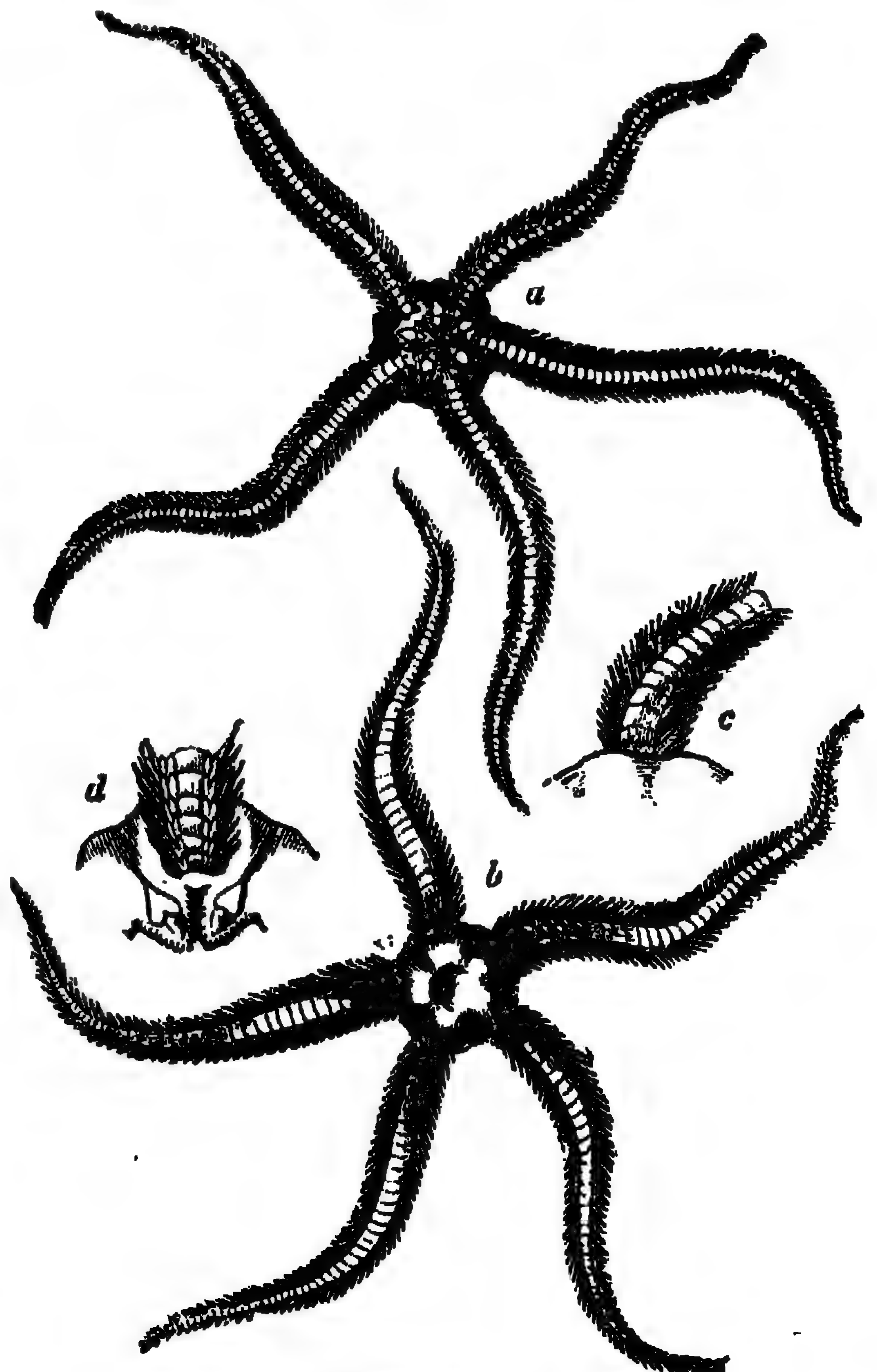
Geographical Distribution.—Australasia; first made known apparently by the voyage of Péron and Le Sueur.



Ophiura annulosa.

View of back (principal figure). a, Portion of arm, under side, magnified; b, the same, upper side; c, front view of centre.

Ophiura granulata (*Ophiura echinata*, Lam., *Stella granulata*, Link.).



Ophiura granulata.

a, front; b, back; c, portion of arm at the back (nat. size); d, the same (front)

Description.—Blackish; disk granulated above; rays echinato-spinose; spines thick, rather longer than the width of the rays.

Geographical Distribution.—European seas, those of the West Indies, the Atlantic, &c.

M. de Blainville states that he has made observations on three species at least of this genus in the three seas which bathe the coasts of France. The genus, he observes, is evidently very distinct from that of the true *Asteriæ* both in the singular disposition of the appendages of the body and from the absence of the madreporiform tubercle. The mouth is also much more efficiently armed in consequence of the manner in which the spines or tubercles unite at the angles of the interfissural spaces of the mouth, so as to form a kind of teeth as thick as the body itself. The eggs are united in considerable oviform masses.

M. de Blainville is further of opinion that the best characters are to be drawn from the number and the length of the lateral spines of the rays, and perhaps from the proportion of these last compared with the diameter of the body; and better still by the disposition and number of the rows of plates which cover the rays. This last appears to him the most certain, and is that to which he has had recourse in his monograph.

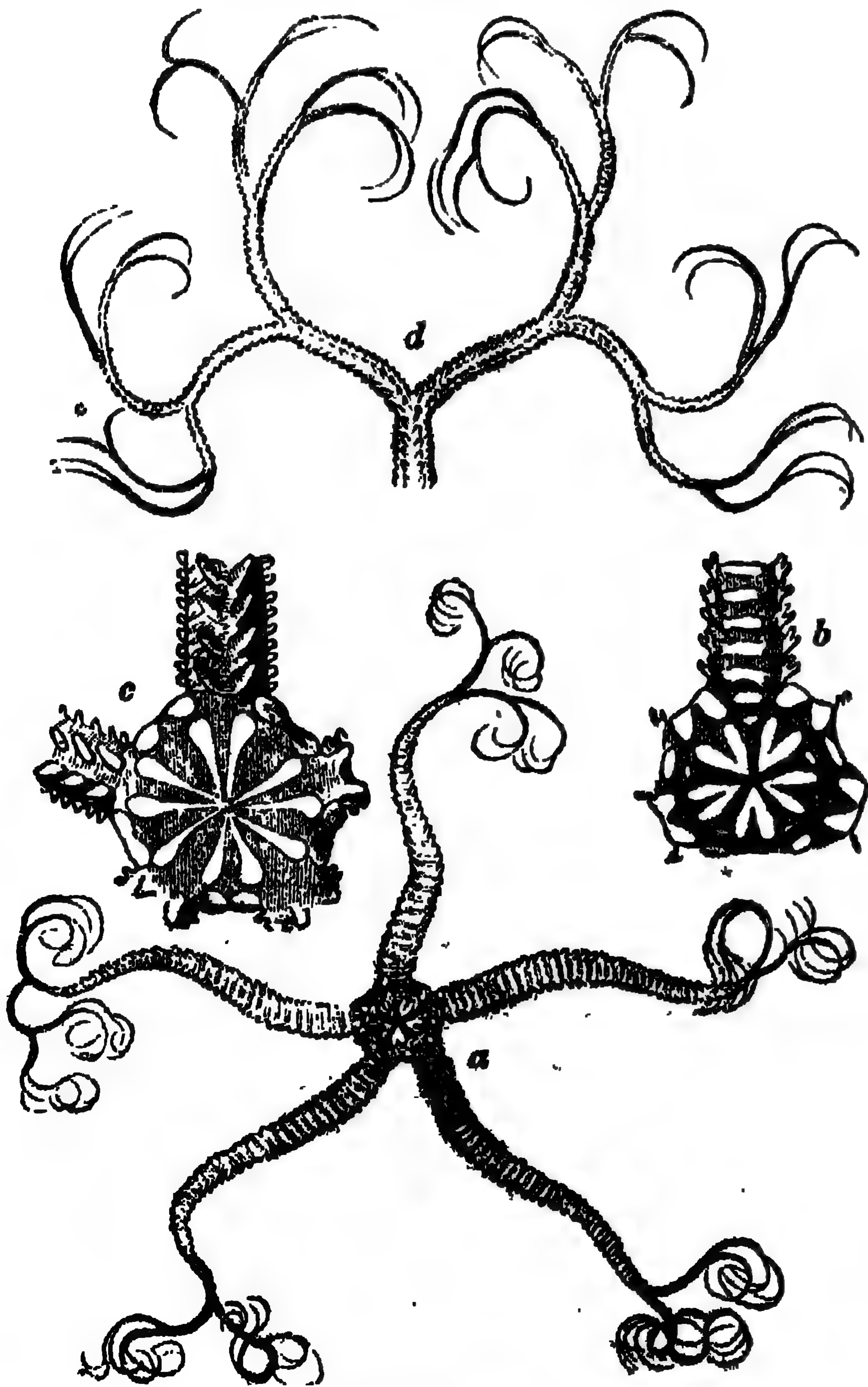
Geographical Distribution.—Very general; hardly any seas are without species of this genus; and there are many in those of Europe, though M. de Blainville thinks that zoologists have exaggerated the number.

Habits.—The *Ophiuræ* swim and creep often with much facility in all directions, agitating the appendages of the arms in a serpent-like manner.

Euryale. (Astrophyton, Link.; Gorgonocephalus, Leach.)

Body regular, depressed, rather small, pentagonal, provided with five appendages or rays rounded above, flattened below, dividing, dichotomizing, and attenuating more and more to the extremities, which are cirrhous.

Mouth at the centre of five converging furrows, in form of holes, not extending to the circumference of the body, and bordered with papilliform suckers. (Blainv.)



Euryale palmifera.

a, front view; *b*, centre and part of arm (front—nat. size); *c*, the same (back —nat. size); *d*, extremity of one arm (nat. size).

α.

Species whose rays dichotomize but little, and at a distance from the root.

Example, *Euryale palmifera.*

Description.—Rays simple below, dichotomo-palmate at the apex; back muricated with two rows of tubercles.

β.

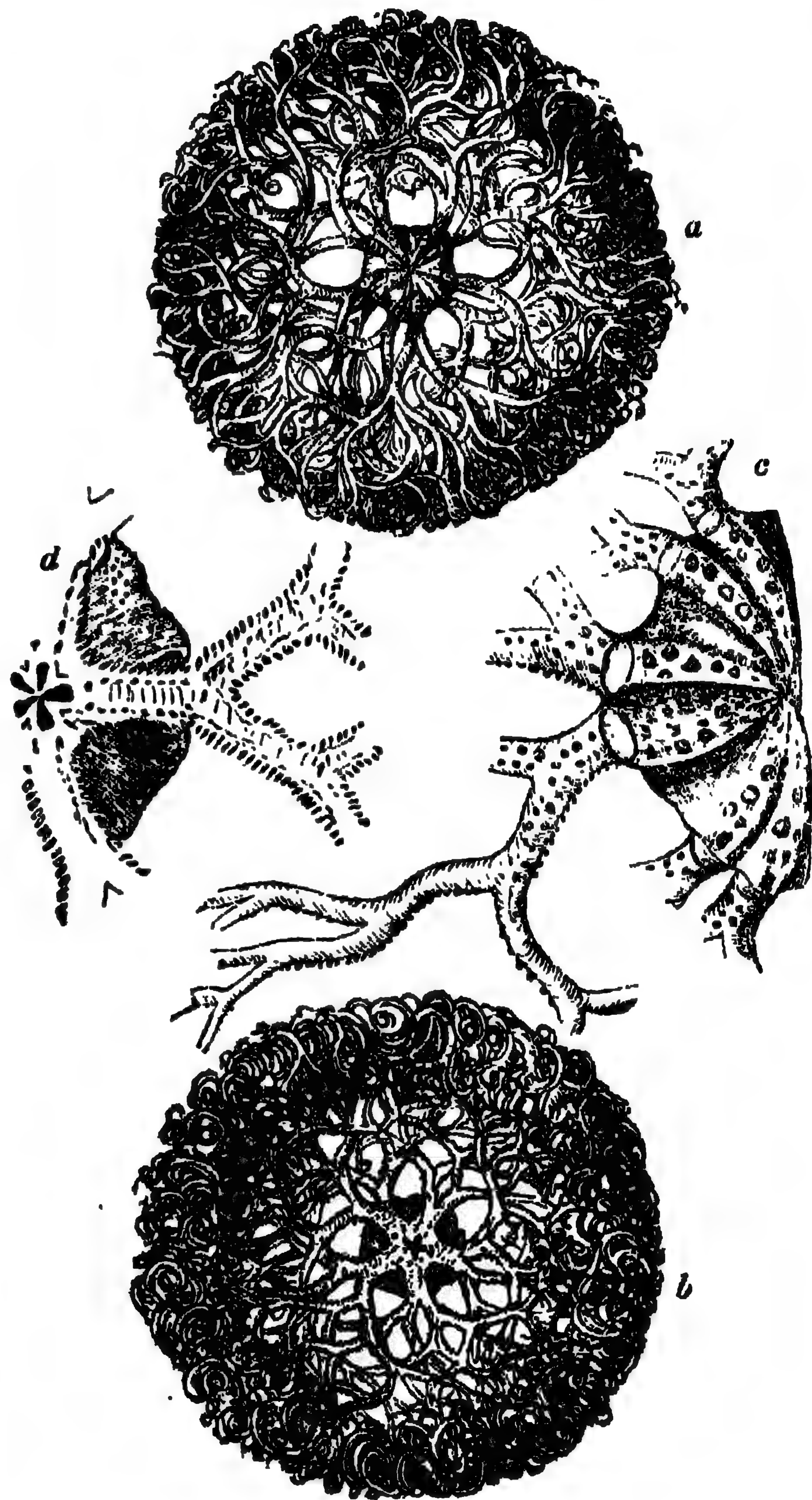
Species whose rays are divided and dichotomized from the base or root.

Examples, *Euryale scutata* and *Euryale costosa.*

Euryale scutata (*Euryale verrucosum*, Lam.; *Astrophyton scutatum*, Link.; *Asterias Caput Medusæ*, Linn.).

Description.—Disk wide, radiated above with warty ribs; rays beneath planulate, bifariously papillose; papillæ very small and submarginal.

Geographical Distribution.—Indian seas and those of the North; said to have been taken on the coasts of Scotland.



Euryale scutata.

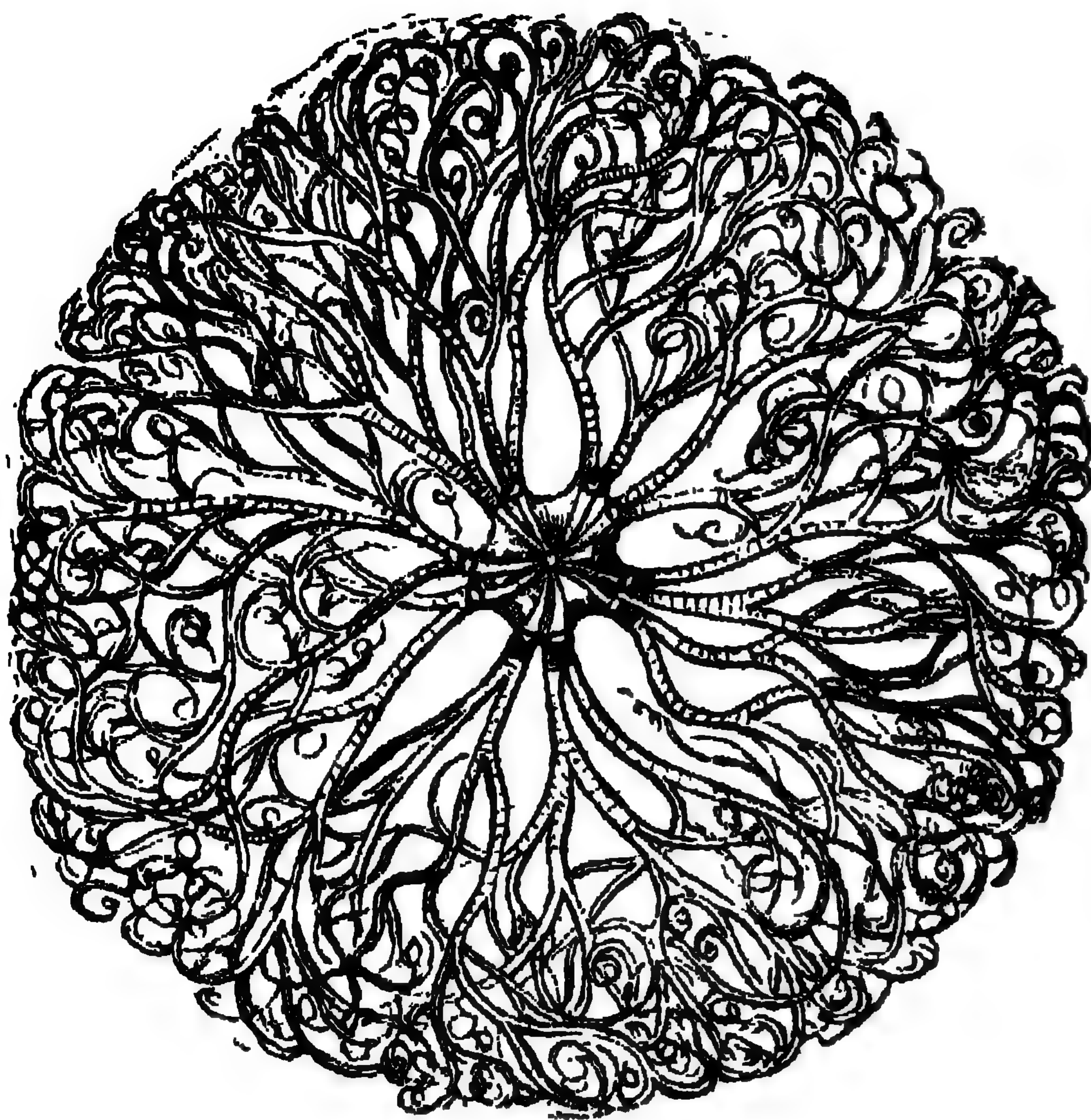
a, back; *b*, front; *c*, central portion of back (nat. size); *d*, the same (front —nat. size).

Euryale costosa. (*Astrophyton costosum*, Link.)

Description.—Back of the disk with ten unarmed ribs in pairs, truncate at the apex; rays dichotomous, very ramose, and transversely rugose.

Geographical Distribution.—Seas of America.

Habits.—M. de Blainville remarks that he knows of no author who has observed an *Euryale* alive, or at least who has published his observations; but it is nevertheless said that these animals make use of the cirrhi of their rays to entrap their prey and bring it to the mouth; that they adhere strongly by their upper disk, and that it is even difficult to detach them. We have often seen them clinging by their arms to the branches of *Gorgoniæ*, &c., and such specimens are to be found in most museums.





Euryale costosa.
a, centre (front—nat. size).

Geographical Distribution of the genus.—Though the species do not appear to be numerous, the form seems to be found in all seas.

FOSSIL ASTEROPHIDIA.

Ophiura.

Professor Phillips, in his 'Geology of the Yorkshire Coast,' figures a species (*Ophiura Milleri*, Phillips) from the marlstone. Mr. Broderip (*Geol. Trans.*, vol. v., 2nd series) describes and figures another (*Ophiura Egertoni*), found in masses of micaceous sandstone which had fallen from the cliffs about half a mile west of Bridport harbour. The last-named species, Mr. Broderip states, approaches very nearly to the recent *Ophiura texturata*.

OPHTHA'LMIA (from *ophthalmos*, ὀφθαλμός, the 'eye') is an inflammation of the eye. General ophthalmia, or an inflammation of the whole globe of the eye, is a very rare occurrence. Cases however do occur, from severe injuries or other causes, in which the signs of all the special forms of ophthalmia are combined, and they are the most formidable affections to which the eye is liable. Unless met by the most active antiphlogistic treatment, they usually terminate in complete destruction of the organ.

In the large majority of inflammations of the eye, one part of it is alone or especially affected. Hence there have been described numerous varieties of ophthalmia, a distinct name being formed for the inflammation of each part or tissue by appending the termination *itis* to its anatomical name; as conjunctivitis, iritis, and corneitis, for the inflammations of the conjunctiva, iris, and cornea. [EYE.]

Of all the varieties of ophthalmia, slight inflammation of the conjunctiva is the most frequent. It is the common result of all slightly irritating bodies being introduced between the eyelids, and of the application of cold, in which case it is often called catarrhal ophthalmia. Its symptoms are redness, varying from a pale-pink to a scarlet colour, of the external membrane of the eye and of the lining of the eyelids, the blood-vessels (which are naturally invisible) appearing swollen and tortuous, and making the front of the eye what is commonly called blood-shot; swelling of the eyelids and increased thickness and puffiness of the conjunctiva of the ball; and an increased secretion of opaque white or yellow tenacious mucus which agglutinates the eyelids. The pain is seldom acute, except in severe cases, in which it has a peculiar character, as if there were dust or fine sand rubbing between the eyelids. There is rarely any intolerance of light or any constitutional affection, and the vision is not at all affected, except by the swelling of the eyelids and the accumulated mucus.

In this, the common inflammation of the eyes, no active means need be employed. In the most severe cases, blood should be taken from the arm; but in general, the application of leeches, cooling lotions applied to the eyes, and mild purgatives or sweating medicines, are sufficient for the removal of the inflammation, which, as it does not affect a part directly important to vision nor spread beyond the tissue first affected, rarely leaves any inconvenience behind. In the mild cases of this kind, a lotion composed of two grains of sulphate of zinc to the ounce of water is the best, and generally a sufficient remedy; the eyes should be washed with it three times a day.

That which is commonly called purulent ophthalmia is a much more serious form of inflammation of the conjunctiva. It was observed in its greatest severity in the European armies engaged in Napoleon's campaign in Egypt, and is therefore sometimes called Egyptian ophthalmia; and from its appearing to spread from one individual to another by the contact of the purulent matter secreted by the inflamed eyes, it has also received the name of contagious ophthalmia. In this form, which has often appeared as an epidemic,* and is generally acknowledged to be liable to spread by contagion, all the symptoms of the preceding are greatly aggravated. The conjunctiva is intensely red, and so swollen that it is raised in a deep ring round the cornea, whose edges it overlaps so as almost totally to obstruct the sight. The conjunctiva of the eyelids is at the same time excessively inflamed, and by effusion into their loose cellular tissue they often become so distended that they completely cover the front of the eye. A considerable quantity of acrid yellow puriform discharge constantly flows between the eyelids, producing excoriations of them and of the cheeks. The pain is often extremely acute, vividly smarting, or hot and burning, and it is accompanied by some intolerance of light. From the conjunctiva, which it first affects, the purulent ophthalmia often spreads rapidly to the other tissues of the eye; producing ulceration and sloughing, or excessive opacity of the cornea, and all the worst results of inflammation of the several tissues, even to suppuration and destruction of the whole of one or both eye-balls.

The treatment of this form of ophthalmia must be active in proportion to the rapidity of its destructive effects when unchecked. Large bleedings, both general and local, should be employed, and repeated till the inflammation is evidently reduced; and purgatives and the various other antiphlogistic means should be administered, as in the treatment of an acute inflammation of the most vitally important organ. When the inflammation is somewhat checked, the greatest benefit is derived from the application of powerful astringents to the eye, a mode of treatment which may be adopted with equal advantage in these and in the severer cases of catarrhal ophthalmia. The best material is a solution of from two to four grains of lunar caustic to the ounce of water; of which one or two drops should be let fall into the eyes once or twice a day, according to the severity of the inflammation. This remedy produces considerable pain for a short time after its application, but is generally productive of the most beneficial results.

One of the most common effects of the purulent ophthalmia, when prevented by active treatment from producing its worst results, is a thickening and roughness of the inflamed lining of the eyelids, to which the name of granular con-

* A severe epidemic of purulent ophthalmia is now raging in the Belgian army. It first appeared in 1814, but it is chiefly since 1830 that it has raged with such extreme intensity as to have attacked an eighth and in some regiments half the soldiers. Since its commencement it has affected more than a hundred thousand persons, and has deprived many of their sight. (See the Report on the ophthalmia of the Belgian army, recently presented to the French Academy of Medicine, by M. Caffe, in their Bulletin of January 15, 1840.)

junctiva is given. The affected surface looks like that of a florid ulcer, and the friction of its irregularities upon the front of the eye-ball keeps up a constant slight inflammation, of which the common consequence is a complete opacity of the cornea. The granular conjunctiva may be treated by the application of powerful astringents or caustics; the most efficient, though a severe remedy, is to rub the rough surface with a piece of sulphate of copper, taking care after its application that no considerable portion of it comes in contact with the front of the eye.

Infants of three or four days old are often the subjects of a very severe form of inflammation of the conjunctiva, to which the name of the ophthalmia of new-born children has been given. Its course and effects are similar to those just described, and it sometimes produces entire destruction of the eye before it attracts proper attention, for the eyelids are commonly agglutinated together by the discharge, and are so swollen that they obscure the front of the eye. Its severest form may be suspected when the upper eyelid is much swollen and is externally of a bright red colour. The treatment must be similar in its principles to that for the corresponding disease in the adult; in severe cases a leech should be applied to the temples and purgatives should be administered in all; and when the inflammation is somewhat relieved, or from the first, if it be not very severe, astringent lotions should be dropped into the eyes. The best form is composed of from two to ten grains of alum in an ounce of water, beginning with the smaller quantity and gradually increasing the strength.

Another form of inflammation of the conjunctiva is that called strumous ophthalmia. It occurs in children of scrofulous habit, and is chiefly remarkable for the extreme intolerance of light by which it is accompanied. The patient cannot be induced to open the eyes, or even to raise them to the light, but keeps his head down, with the eyelids pressed together upon the ball of the eye, and carefully covered with his hands or his clothes. The degree of inflammation is by no means proportionate to the severity of this symptom; the conjunctiva is usually only a little reddened, but in many cases little pustular elevations form upon the edges of the cornea. The treatment of these cases should be chiefly that adapted for the constitutional disorder on which their peculiarities depend. [SCROFULA.] Pure air and exercise, mild aperients and tonics, and especially bark and iodine, should be administered, and the general health should be carefully attended to. In the earlier stages a few leeches may be applied, but afterwards counter-irritation by blisters placed behind the ears, or by tartar-emetic ointment rubbed on the same parts, is most useful. Slightly astringent lotions may also be applied to the eyes, and the ulcers or little pustules on the cornea touched with the solid nitrate of silver (lunar caustic).

The characters of inflammation of the sclerotica are very different from those of inflammation of the conjunctiva, but very often the two affections are coincident, so that the appearances belonging to each are confounded. In sclerotitis, as this form of ophthalmia is sometimes called, the redness of the eye has a rose-pink or violet tinge, rather than the scarlet hue which is seen in the preceding form; for the distended vessels are fewer and smaller, and are to a certain extent obscured by the conjunctiva, beneath which they lie. This redness is most intense in a zone around the cornea, at which the enlarged vessels are concentrated like rays, and from whose outer border the redness diminishes in brightness till it is nearly lost at the angles of the eye; and by this circumstance sclerotitis is further distinguished from inflammation of the conjunctiva, in which the redness increases with the distance from the cornea. In sclerotitis there is always considerable pain of a dull heavy kind, which often extends all round the orbit, or over the forehead and head, and is accompanied by intolerance of light and a profuse secretion, not of mucus, or pus, as in the preceding cases, but of hot tears. The pain is very often aggravated in the evening, or throughout the night.

The treatment of inflammation of the sclerotica must, as far as general means are concerned, be the same as for acute inflammation of the conjunctiva. The application of astringents or stimulants is useless, and sometimes injurious; the vapour of hot water and other warm fomentations are the local means which are most agreeable to the patient. The moderate use of mercury is generally useful. In rheumatic and gouty conditions of the system, with which this form of ophthalmia is often connected, and is then called rheumatic or arthritic ophthalmia, the treatment adapted to the general disorder should, as far as possible, be combined with those means which are proper for the local disease. [GOUT; RHEUMATISM.]

Inflammation of the cornea, corneitis, or keratitis, is very generally connected with some degree of the preceding. Its signs are those which are common to the inflammations of all the deep-seated tissues, viz. dull pain, intolerance of light, and profuse discharge of hot burning tears; at the same time a few vessels passing inward from the red zone around the cornea become visible upon its surface; it loses its transparency and becomes hazy, or assumes a greyish and often an opaque chalky-white hue, from the deposition of lymph between its laminæ. [LEUCOMA.] In very severe cases suppuration takes place in the cornea, and it acquires a yellow colour and ulcerates; or matter is poured into the anterior chamber [HYPOPIUM], or the cornea is perforated by ulcers and the iris protrudes; or it sloughs and becomes soft and weak, so that staphyloma is produced.

The treatment of corneitis in its active state is the same as that for inflammation of the sclerotica. After the inflammation is subdued, its effects (which the situation of the cornea renders peculiarly important) admit of but little useful treatment. The opacity which remains, when it is superficial, is usually gradually removed, and that process may be in some degree assisted by the application of a weak solution of nitrate of silver or some other stimulant; the ulcerations generally proceed best when left to themselves, the chasms which they leave being gradually filled up, and the yellow tinge of the cornea which accompanies them being exchanged for a grey or bluish colour; the more serious effects, such as staphyloma, extensive leucoma, sloughing, protrusion of the iris, &c., are irremediable.

Inflammation of the iris has already been treated of. [IRITIS.]

Inflammation of the membrane of the aqueous humour is not uncommon in young persons; it is marked by dullness and haziness of the cornea (which is surrounded by the vascular red zone formed by the distended vessels of the sclerotica), an alteration in the colour of the iris, which assumes a dull reddish hue, and a turbid or purulent appearance of the aqueous humour, with, in some cases, hypopium. The proper treatment does not differ essentially from that of inflammation of the iris or sclerotica, with which this form of ophthalmia, like all the affections of the deep-seated tissues of the eye, is very generally conjoined.

The inflammations of the parts of the eye which are still more deeply seated are much rarer than any of the preceding; their symptoms also are more obscure, and they are seldom found uncombined with those of some other form of ophthalmia. Their signs are similar to those of the inflammations of the sclerotica and cornea; but the intolerance of light and the loss of vision are usually greater than would arise from the degree of inflammation which exists in the visible tissues. The treatment must be similar to that for the acute inflammation of the iris or cornea, and be actively administered for the nature of the parts affected renders the least disorganization of them of the highest importance.

All kinds of ophthalmia may either become chronic after having existed for some time as acute diseases, or may be chronic from their commencement. Their symptoms in either case differ only in degree from those of the corresponding acute forms, and the treatment of them should be the same in principle, though less active. Counter-irritation by blisters or other means, applied to the neighbourhood of the eyes, or setons in the back of the neck, are among the most useful means; and of the milder forms of astringent lotions, the *vinum opii* is the best for all the more superficially seated of the chronic ophthalmiæ.

O'PICI. [OSCI.]

OPIE, JOHN, the son of a carpenter at St. Agnes near Truro in Cornwall, in which parish he was born in 1761, was one of those artists who may be said to have been gifted with an intuitive feeling guiding them towards a destination against which all circumstances appear to conspire. In this respect there was a striking similarity between Opie and Carstens. [CARSTENS.] The humble condition of his family was the least obstacle; for besides that, there was nothing around him either to awaken his perceptions of art or to encourage his early attempts in it. Intending to bring

him up to his own trade, his father was much more disposed to check what he considered an idle boyish pastime than to foster proofs of dawning talent. Opie however was not to be deterred by his father's disapprobation; he began to take likenesses of his relations and neighbours, the fame of which productions caused him to be regarded as a prodigy, and attracted the notice of Dr. John Wolcot (Peter Pindar), then practising as a physician at Truro. The Doctor possessed considerable knowledge of painting, and took Opie into his house in the double capacity of his protégé and his footboy. How long he remained beneath Wolcot's roof is not known, nor what immediately led to his quitting it. Opie afterwards came to the metropolis under the doctor's immediate care and protection. In the time between leaving his service and coming up to town, he pursued his art as an itinerant portrait-painter, and with such success, that though his charges never amounted to the value of any gold coin, he was able not only to make a smart appearance, but to remit money to his mother.

On arriving at London with Wolcot (1781), he was introduced to Sir J. Reynolds, whom he found more liberal of advice than lavish of expressions of astonishment at the talents of an untaught lad. Wolcot's object however was to secure immediate fame for his protégé as a miraculous genius, and distinction for himself as a discriminating and generous patron.

Aware that the public are always ready to meet any novelty or wonder more than half way, the doctor took his measures accordingly, and with such success, that within a very short time his Cornish lad became almost the rage among the fashionable world. Visitors and sitters so thronged around him, that their carriages literally crowded the street where he resided. But people cannot wonder for ever: the fever of fashionable admiration subsided almost as rapidly as it had come on; not that Opie was absolutely left all at once without sitters, but he was comparatively deserted:—public curiosity had been gratified. In fact he was ill suited to become a permanent favourite with the fashionable; there was nothing engaging in his person and address, no flattery either in his language or his pencil, which latter possessed much more of vigour and homely truth than of grace and artificial refinement; and he succeeded far better with male heads and strongly marked countenances than with females and with pretty faces. When it had subsided, however, the tide of fashionable patronage left him in comfortable circumstances. He further sought to establish his independence by marrying the daughter of a wealthy pawnbroker, but the match proved a most unhappy one, and he was glad to obtain a divorce. In 1798 he ventured upon a second union, and married Amelia, the daughter of Dr. Alderson, a physician at Norwich. In this lady, who subsequently became one of the most popular novelists of the day, he found an intellectual companion and judicious adviser.

Instead of abandoning portrait-painting on the discouragement immediately following his first success, Opie divided his attention between that and historical painting, in which latter his best known productions are—'The Murder of James I. of Scotland;' the 'Death of David Rizzio;' 'Arthur taken prisoner;' 'Hubert and Arthur;' 'Belisarius;' 'Juliet in the garden,' &c. None of these works affect ideal beauty or refined poetical conception, but they are stamped by a peculiar energy of style, and by a vivid reality, for instead of attending to conventional beauties, the artist adhered closely to his models; one fortunate consequence of which was the striking and remarkable truth of his colouring.

Opie's education had been exceedingly limited, and was in no degree a literary one. Sensible of his deficiency in that respect, he sought to repair it in after-life by studying the best English authors, and having a clear judgment and a strong memory, distinguished himself in conversation by his force of intellect. Thus qualified he aspired to the professorship of painting at the Royal Academy, having previously delivered a course of lectures at the British Institution; but he withdrew on finding himself opposed by Fuseli. When the latter was obliged to resign on being appointed Keeper, Opie again offered himself as candidate, and was chosen. He delivered only four lectures (afterwards published by his widow), in the months of February and March, 1807. On the 9th of the following April he died, and was buried on the 20th in St. Paul's cathedral, near Sir J. Reynolds.

OPI'LIUS. [MACRINUS.]



Coin of Opilius.

British Museum. Actual size.

OPISTHO'COMUS. [CRACIDÆ, vol. viii., p. 131.]

OPITZ, MARTIN, considered the father of modern German poetry, was born at Bunzlau in Silesia, in 1597. While at the gymnasium at Breslau, he produced several Latin poems, which were printed. On quitting Breslau, he studied successively at Beuthen, Frankfort, and Heidelberg; and it was at the first-mentioned place that he composed his dissertation entitled 'Aristarchus, sive de Contemptu Linguæ Teutonicæ,' 1618, in which he vindicates the merits of his native tongue. At Heidelberg he formed many literary friendships, and met with patrons whose attachment afterwards proved highly serviceable to him.

Having renounced his legal studies, he began to employ his pen very industriously both in Latin and German composition. Yet, whether from restlessness of disposition or some other cause, he was continually changing his place of abode. Scarcely had he been a year at Heidelberg when he quitted it for Strasburg, and in the course of a short time after (1620) visited the Netherlands, when he became acquainted with Vossius, Rutgersius, and Dan. Heinsius. The example of this last eminent scholar determined him to cultivate his native tongue with still greater assiduity, and to do for the German language and poetry what had already been accomplished in that of Holland. In the following year he accompanied his friend Heinrich Albert Hamilton, a young Dane of noble family, to Holstein; and while he was his guest composed his 'Trostgedicht,' or poem on Consolation in the Disasters of War, which however he did not publish until nearly thirteen years afterwards (1633), when war was raging in Germany. In 1622 he was invited by the Prince of Siebenbürgen (Gabriel Bethlen) to become teacher of philosophy and humanities at the school of Weissenburg. It was during his residence there that he commenced his 'Dacia Antiqua,' an historical work of great labour and research, on which he employed himself for sixteen years, but which was left incomplete, and lost when his MSS. were dispersed after his death. He returned to Liegnitz in 1623, and in the following year appeared the first edition of his poems. Not very long after he spent some time in travelling through Saxony, and subsequently proceeded to Vienna, where he was noticed by Ferdinand II., who even bestowed a laurel crown upon him for his poem on the death of the archduke, which production however was rather a triumphal song in honour of the Austrian monarchy.

In 1626 he accepted the post of private secretary to Count von Dohna, a nobleman equally eminent as a soldier, a statesman, and a scholar; and notwithstanding his patron was a Catholic, and Opitz a Lutheran, with very little taste moreover for military affairs, they lived together upon the very best footing, and the poet was enabled to gratify his passion for travelling, by accompanying the count to Paris, where he became acquainted with Hugo Grotius and other eminent literary persons. His patron dying shortly after (1633) their return from France, Opitz (who had previously had a patent of nobility conferred upon him by the emperor, with the style of Opitz von Boberfeld) met with another protector in the Duke of Brieg, who enabled him to visit Prussia, in order that he might there pursue his studies at a distance from the troubles which then agitated Germany. For some time he continued settled at Danzig, where, having recommended himself to Uladislaus IV. of Poland, by a poem on his campaign against Russia—one of his most masterly and energetic productions—he was appointed Polish historiographer. But while his literary reputation was daily increasing, and his circumstances becoming more prosperous, a dreadful plague broke out in Danzig, to which he fell a victim, August 20th, 1639, in his forty-second

year. Owing to the fear of contagion, his papers and manuscripts were put away and irrecoverably lost.

His published works however sufficiently attest the important services he performed for German literature, more especially as regards the language and its mechanical structure. As a poet he can be considered great only by comparison with his predecessors and contemporaries. Though strong native good sense and amiable feelings display themselves in his productions, together with great correctness and purity of style, and occasionally great felicity of expression, there is more of the orator than of the poet in his compositions; more of elaborate study and sound judgment than impassioned feeling. Still he rendered most essential services to the literature of his country; and but for his labours in refining the language, the poets of the eighteenth century would have had to contend with nearly all the difficulties which the labours of Opitz had helped to remove. Opitz succeeded best in moral and didactic subjects, such as his 'Preis der Gemuthsruhe,' 'Vielgut,' &c. Among his lyric productions his version of the Psalms contains some of his most successful efforts. His prose style has also much merit, and recommends itself by the qualities of correctness, precision, and clearness, in which respect his translation of Barclay's 'Argenis' (1626) is a masterpiece, considering in what condition the language was at the time when it was produced.

OPIUM. [PAPAVER.]

OPIUM TRADE. The cultivation, mode of preparing, and medical properties of opium, are treated of under PAPAVER: in the present notice we shall confine our attention to the consumption and commerce of opium.

The principal countries in which opium is medicated are India, Turkey, and Persia. The poppy is cultivated in Egypt and Arabia; in Italy, France, and several other parts of Europe; but, with the exception of the two former countries, rather for the sake of its capsule and the oil extracted from its seeds than for the inspissated juice. Indian opium is distinguished into two kinds, the Patna, grown in the province of Bahar, and that grown in the province of Benares, the former of which is most esteemed. The opium produced in the district of Malwa is still less esteemed than that of Benares, being, it is said, not so 'pleasant,' and the flavour less 'mellow;' and the best Indian opium is inferior to that of Turkey. For some time the quantity of opium produced and brought to the Eastern markets from all parts was not equal to the demand, and the Malwa and Turkish opium were introduced to supply the deficiency. At first there was a strong prejudice against the latter. The Turkey opium was introduced into the Indian Archipelago in 1815, and the merchants reluctantly consented to its constituting one-fourth of the supply for the year; but two years afterwards they expressly stipulated for one-half, and in the following year for three-fourths, although the price rose, while Indian opium was stationary. A strong preference has also been shown in China for the Turkish opium, which has been introduced by the Americans. The annual imports of Turkey opium into China are estimated at about 1500 chests. Several thousand persons are engaged in the cultivation in Turkey. They are generally very poor, and the quantity annually brought to market by each cultivator does not usually exceed one or two baskets. The annual average produce of Turkey is estimated at 3000 baskets, or about 400,000 lbs., equal in weight to 2666 chests of the Indian opium. The whole quantity of land under the poppy cultivation in India is said not to exceed 50,000 acres, and perhaps about as many persons are employed in the cultivation. It is under a strict monopoly, and the advances made by the government are a great inducement to the peasant to engage in the cultivation. Milburn (*Oriental Commerce*, p. 294) gives the following account of the opium monopoly:—'The monopoly in the trade of opium, or the cultivation of the poppy, may be traced at least as far back as the commencement of the British influence in Bengal. The advantages resulting from it were for several years merely considered as a part of the emoluments of certain officers under the government. In the year 1773 it was taken out of their hands, and the profit of the trade assumed for the benefit of the Company. The provision of the article was for many years let out upon contract. The opium concern continued under the direction of the Board of Revenue till 1793, when it was transferred to the Board of Trade. On the expiration of the contracts, in 1797, the cultivation of opium was restricted to Bahar and Benares, and discontinued in Bengal: the mode of provision by agency was resorted to, and still continues in practice. In July, 1799, some regulations were published "for the guidance of all persons concerned in the provision of opium on the part of government, and for preventing the illicit cultivation of the poppy and the illicit importation or traffic in the article of opium." Under these regulations, which were further modified in 1807, the cultivation of the poppy, except on account of government, is expressly forbidden; but it is left entirely at the option of the cultivator to enter into engagements on account of government at a settled price, or to decline it altogether. The quantity grown, which is limited, is sold by public auction at two annual sales at Calcutta, in December and February.' The monopoly is said in some years to have yielded 1,000,000*l*. It has not been possible to extend it to Malwa, but the East India Company grant passes for the transit of Malwa opium to the place of shipment. (Report of a committee of the House of Lords 'On the Affairs of the East India Company,' 1830.)

Opium is often adulterated with the pulverised leaves and stalks of the poppy, which are mixed up into a mucilaginous mass with gum arabic or some similar substance. Milburn (*Oriental Commerce*) gives the following directions for testing the quality and purity of opium:—'Opium is very heavy, of a dense texture, commonly soft enough to receive an impression from the finger. It should be chosen moderately firm; its colour a very dark-brown yellow, so dark that, unless held to the light, it appears black; of a strong smell and bitter taste; as free from leaves as possible; and care should be taken, by rubbing it between the finger and thumb, that there is no roughness or grittiness. That which is soft should be rejected.' In Sumatra the opium prepared for smoking is frequently adulterated with pine-sugar, and crude opium with the fruit of the pisang, or plantain.

The East India opium is exported in chests, of 150 lbs. each, lined with hides. The principal market is China; but it is also in demand in all Eastern countries, the Malay Peninsula, Sumatra, Borneo, Celebes, and other islands of the Indian Archipelago. In 1821, of the total quantity exported from Calcutta, three-fourths were for China and Macao, a fifth for Penang, and between a seventh and an eighth for Java. Mr. Crawfurd states (*Indian Archipelago*, vol. ii., p. 520) that in the islands opium sold at an advance upon the monopoly price of Bengal of 168 per cent., and upon the first cost of 3025 per cent. It is a lawful trade throughout all the islands, but the article pays a heavy duty. In Java the native princes monopolise the sale, and farm it to the European government. In 1820 the consumption of the island was about 550 chests, but varied with the annual price. Previous to 1811, under the Dutch government, the annual consumption varied from 800 to 1200 chests; but while Java was in our possession, Sir Stamford Raffles fixed it at 300 chests, without exciting any disturbance or creating an illicit trade. The opium trade is farmed in Sumatra. In Siam opium is a prohibited article; and in a commercial treaty which the Siamese entered into with the East India Company in 1833, it is declared liable to be seized and destroyed whenever found.

Mr. Davis states ('China,' vol. ii., p. 453) that an engrossing taste for opium pervades all classes in China, and that it has spread with astonishing rapidity. 'From the superior classes, who were the first to practise it, the habit of opium smoking has descended and become general. 'Worthless subordinates in offices and nefarious traders first introduced the abuse; young persons of family, wealthy citizens, and merchants adopted the custom; until at last it reached the common people. I have learned on inquiry, from scholars and official persons, that opium smokers exist in all the provinces, but the larger proportion of them are to be found in the government offices; and that it would be a fallacy to suppose that there are not smokers among all ranks of civil and military officers below the station of provincial governors and their deputies.' (Memorial to the Emperor, from one of the Chinese Censors.) Mr. Gutzlaff ('Journal of Three Voyages,' p. 61) says of the Chinese sailors, that most of them are smokers of opium, and that when the weather is rough, and more than ordinary attention is required from them, they turn in and intoxicate themselves with this drug; and on shore they indulge in smoking it until all their wages are squandered. The drug is prepared for smoking by being boiled or seethed to separate the resinous parts, and the remainder is made up into

small balls, one of which is placed in a wooden pipe with some combustible substance, when as many whiffs are taken as the habit of the smoker will permit. At convivial entertainments a dish of the prepared opium is often brought in with a lamp, and the host, taking up a large pipe, lights it, and after two or three whiffs, passes it to his guests, the pipe making its rounds until all are intoxicated. The whole of the tribes of the Indian Islands more frequently smoke opium than eat or chew it. They in fact chew tobacco and smoke opium, while the practice of the Turks and other people of Asia is directly the reverse. Raffles states ('Java,' vol. i., p. 112) that in this island the opium prepared for smoking is used along the coast, and crude opium is chewed by the people of the interior. He tells us that 'the use of opium, though carried to a considerable extent, is still considered disgraceful, and persons addicted to it are looked upon as abandoned characters.' (Vol. i., p. 114.) On the west coast of Celebes, the principal rajah and his family, and the various smaller rajahs amongst whom the country is divided, are the chief opium smokers, persons of inferior rank not being able to command the luxury. In Sumatra and Borneo the drug is subjected to nearly the same preparation as in China. (J. H. Moor's *Notices of the Malayan Archipelago.*) Marsden states ('Sumatra,' p. 277) that in that island the opium, after being seethed, is strained and then boiled. The leaf of the *tambaku*, shred fine, is then mixed with it, and the whole is made into pills of the size of a pea, one of which is put into the pipe, and a light being applied, it is consumed at one whiff or inflation of the lungs. In some parts of India, opium is presented at visits and entertainments in the same familiar manner as a snuff-box. The prohibition of intoxicating liquors by the Mohammedan law has, it is believed, encouraged the habit of taking opium; and in consequence of the Turks of the present day being far less bigoted than formerly, the consumption of opium is said to have declined with the more frequent indulgence in wine and arrack. The race of *Theriakas*, or habitual opium-eaters, has not however become extinct. The habit is believed to be more prevalent at present in Persia than in Turkey, though it is not often carried to the same excess. The opium stalls in the bazaars, around which the wretched and haggard victims of opium-eating assemble for their daily supply, remind the Englishman of gin-drinking in his own country.

In Europe opium is almost wholly employed as a medicine. It has been made in England from the native poppy, but the cultivation is not likely at any time to become worthy of attention on a large scale. The abuse of opium is said to have been latterly increasing in England, and the cause of this has been attributed to the Societies whose members are pledged to total abstinence from fermented and spirituous liquids; but although this statement has been made by members of the medical profession, it does not appear to rest upon any good evidence. It is said, we believe with some truth, that opium is taken for its intoxicating properties rather extensively in Lincolnshire, the practice having originated in its use as a remedy for the ague; and in the manufacturing districts in Lancashire it has been asserted that its use was rather common, but the fact is not at all well established. Laudanum, a preparation from opium, is made use of to a very great extent by ignorant and careless mothers and nurses. From a Return to the House of Commons in 1839, which however is not quite complete, it appears that out of 543 persons in England and Wales who died from the effects of poison in 1837 and 1838, and on whom inquests were held, the fatality was occasioned by opium or its preparations in not fewer than 186 cases; and nearly one-seventh (72) of the whole number of cases were young children, most of them under one year, to fifty-two of whom an overdose of opium, or some medicine of which it formed the chief ingredient, had been given, and in twenty other cases the children had been poisoned by taking such medicines by mistake. The coroner for Nottingham stated in his Return, that at a shop in that town, in which the attendants were two girls, one of them was in the habit of selling twice as much laudanum for a penny as the other. There is every reason to believe that the deaths which occur without exciting public attention, and which arise from the indiscriminate and injudicious use of cordials and other made-up medicines for children, of which opium is the basis, are as numerous as those which come under the cognizance of the coroners.

The opium consumed in this country is chiefly from Turkey. From 1827 to 1834, the total quantity imported into the United Kingdom was 688,443 lbs., of which 581,380 lbs. were from Turkey. Opium in small quantities is a permanent article of import from Italy and France; occasionally, but in still less quantities, it is imported from Russia, Germany, Holland, and Belgium; and but rarely from India. Within the last few years Egypt has exported opium to England, and the quantity has been yearly increasing. In 1838 the total quantity of opium imported into the United Kingdom was 95,832 lbs. from the following countries:—Turkey, 80,554 lbs.; Egypt, 12,324 lbs.; Holland, 270 lbs.; France, 102 lbs.; Gibraltar, 409 lbs; Italy, 895 lbs.; Syria, 571 lbs.; East Indies, 580 lbs. The quantity re-exported was only 13,028 lbs. In 1837 the imports were 79,651 lbs.; and 67,476 lbs. were exported to the undermentioned countries:—Russia, 836 lbs.; Germany, 1289 lbs.; Holland, 2199 lbs.; Belgium, 116 lbs.; France, 243 lbs.; Portugal, 337 lbs.; Turkey, 234 lbs.; China, 58,874 lbs.; United States of America, 3180 lbs.; Egypt, 53 lbs.; and in trifling quantities to several other parts. The supply received from each country is liable to great fluctuations. In 1833 the quantity imported from France was 11,508 lbs., and from Italy, in the same year, 9452 lbs. In 1830 the supply from Turkey was 192,136 lbs.; in the following year 8184 lbs.; and again in 1834 it amounted only to 12,438 lbs., though the importation in the previous year had not exceeded 72,020 lbs. On the 5th January, 1832, the quantity of opium in bond in London, Liverpool, Bristol, and Hull, was 10,674 lbs.; and on the 5th January, 1833, 20,517 lbs. Up to 1828 the duty was 9*s.* per lb., but in that year it was reduced to 4*s.*, by 9 Geo. IV., c. 76; and in 1836 to 1*s.*, by 6 and 7 Wm. IV., c. 60. The price of Turkey opium in bond, in 1831, was from 17*s.* to 18*s.*; in 1838, 14*s.* to 14*s.* 6*d.*; and in November, 1839, the price had fallen to 10*s.* per lb. The low price in the latter case was in a great measure, occasioned by the then existing state of the opium trade in China; but it has since risen to 12*s.*, and a Greek house in London holds a thousand chests at a still higher price.

Mr. Davis states ('The Chinese,' vol. ii.) that opium has always been prohibited in China; but this does not appear to have been the case. It was a legitimate branch of trade down to the close of the last century, prohibitory regulations having been first made in 1796. From this period the trade has always been contraband, and yet in little more than forty years the consumption of Indian opium in China has risen from 1000 to about 27,000 chests per annum. Opium has constituted about one-half of the total value of British imports at Canton and Lintin, and tea has formed something less than the same proportion of our exports, that is, the value of the opium sent to China has exceeded the value of the tea which we have taken from that country. This fact is shown in a table in Mr. Davis's work:—

Imports in 1833.	Dollars.	Exports in 1833.	Dollars.
Opium	11,618,617	Tea	9,133,749
Other imports	11,858,077	Other exports	11,309,521
	23,476,244		20,443,270

Nothing but the extraordinary corruption of the Chinese authorities can account for this increase of a trade prohibited by the laws; but it is another proof of the difficulty of putting in force regulations which are at variance with the popular habits and taste.

Macao was at first the centre of the Indian opium trade, but in 1802, in consequence of the conduct of the Portuguese towards the British merchants, the trade was removed to the island of Lintin. Here the opium is kept stored in armed ships, and delivered to the Chinese by written orders from Canton, on the sale being concluded and the money paid at that place.

In 1832 the number of chests of opium imported into China was 23,670, of the total value of 15,338,160 dollars, or above 3,000,000*l.* The price had been falling for several years, and at the same time the quantity imported had increased. Mr. Davis, writing in 1836, expresses an opinion that this increase had rendered the Chinese rather more strict in the prevention of opium smuggling. The Chinese censor showed, in the memorial to the emperor already quoted, that the 'magistrates of districts issue proclamations interdicting the clandestine sale of opium, at the same time that their kindred and clerks and servants smoke it as before. Then the nefarious traders make a pretext of the interdict for raising the price. The

police, influenced by the people in the public offices, become the secret purchasers of opium, instead of labouring for its suppression; and thus all interdicts and regulations become vain.' In 1833 the emperor was induced to issue some fresh regulations for checking the introduction of opium, awarding punishments of various kinds to the different classes of offenders. 'Let the buyers and smokers of opium be punished with one hundred blows, and pilloried for two months. Then let them declare the seller's name; and, in default of this declaration, let the smoker be punished, as an accomplice of the seller, with a hundred blows and three years' imprisonment. Let mandarins and their dependents who buy and smoke opium be punished one degree more severely than others; and let governors and lieutenant-governors of provinces, as well as the magistrates of subordinate districts, be required to give security that there are no opium smokers in their respective departments. Let a joint memorial be sent in at the close of every year, representing the conduct of those officers who have connived at the practice.' From a communication in the 'Colonial Gazette,' No. 39, and also from a pamphlet published by an American merchant at Canton, it appears probable that the Chinese government is less alarmed about the introduction of opium, than at the drain of bullion which the opium trade occasions. Formerly the produce of China was paid for in silver, but opium has so successfully served the purpose as a medium of commercial exchange, that it has been less necessary to employ coin or bullion. The opium trade has thus been the means of draining China of the precious metals; and this process has been going on for the last twenty years, until their price has risen. The Chinese do not regard gold and silver as signs of wealth merely, but as wealth itself, and in many of their public documents relating to the opium trade the export of silver is also noticed; and in some cases it is difficult to ascertain which is considered the paramount grievance. In 1836 an officer of the Chinese government proposed that opium should be rendered a legitimate article of commerce, and that the cultivation of the poppy should be permitted. Extraordinary as it may appear, the poppy is cultivated in China through the connivance of the local functionaries, who are the most corrupt officials in the world. The cultivation is carried on in at least six different provinces in opposite extremities of the empire, and in one of these provinces the quantity of opium prepared annually amounts, it is said, to several thousand chests, that is, about as much as was imported into the whole of China forty years ago; and, adding the quantity prepared in the other five provinces, the growth of Chinese opium is already considerable; and it will be very powerfully stimulated by recent circumstances connected with the supply of the foreign article.

In March, 1839, the Chinese authorities appear to have taken active steps with a view of putting a stop to opium smuggling, by seizing a number of British merchants, and retaining them in custody until the stock of opium on hand belonging to all foreigners was delivered into their hands. On the recommendation of Captain Elliot, the superintendent of the British trade at Canton, 20,283 chests of opium, worth nearly 3,000,000*l.* sterling, were delivered to the Chinese authorities. The whole of the opium was subsequently destroyed by the Chinese, foreigners being invited to witness the operation. Three vats, 175 feet by 75, were prepared, and each chest being re-weighed and broken up in the presence of superior officers, the contents were thrown into the vats. The destruction was partly effected by salt and lime, and a large number of men were employed from day to day with long rakes in macerating the opium until it had become a fetid mud, when sluices were opened which communicated with the river, and the whole was washed away. The spot where this operation took place was well guarded, the workmen were ticketed, and the Chinese government, in the destruction of the drug at least, acted with perfect sincerity. About 300 chests per day were destroyed. The merchants then retired to Macao, but after a residence of three months they were expelled by the Chinese on the 27th of August, in consequence of Captain Elliot's refusal to give up for punishment a seaman (whose name could not be discovered) charged with killing a Chinese in a brawl. They retired on board the English merchantmen at Hong-Kong, but the fleet being in want of provisions, Captain Elliot, on the 4th of September, attempted to procure a supply from the natives, but was opposed by three Chinese war-junks, and a conflict ensued in which several Europeans were wounded and some Chinese killed. A fresh attack, which was to have taken place at day-break on the 5th, was countermanded by Captain Elliot. This affair has complicated still more our commercial relations with the Chinese. The receipts which Captain Elliot gave to the British merchants, on behalf of the English government, promising indemnity for the sacrifice of their property, have been offered as 'opium scrip' in the markets of Calcutta, Madras, and Bombay, and have also been remitted to London for negotiation. Captain Elliot holds his appointment under the 3 & 4 William IV., c. 93, passed for 'regulating the trade to China and India.' This act provides for the establishment of a British authority in the dominions of the emperor of China, and invests the superintendent with many important powers relating to the trade. The decision of the English government in reference to this subject, whether it will honour Capt. Elliot's opium drafts or what steps it may order to be taken in China, are at this moment (January, 1840) unknown in England. A communication was sent in November, 1839, by the Foreign Office to the East India and China Association, in reply to an address from that body, from which it appears that the propriety and expediency of Captain Elliot's proceedings, so far as they were then known, were approved of by the government; but in a second communication, dated on the following day (November 28th, 1839), the secretary of state for foreign affairs declined notifying the intentions of the British government in reference to a blockade of the Chinese ports. In the Queen's speech on the opening of parliament, January 16, 1840, the state of the British interests in China was alluded to in the following terms:—'Events have happened in China which have occasioned an interruption of the commercial intercourse of my subjects with that country. I have given, and shall continue to give, the most serious attention to a matter so deeply affecting the interests of my subjects and the dignity of my crown.' In the meantime the government sales of opium at Calcutta are not discontinued, and 18,932 chests are advertised to take place in the agencies of Bahar and Benares, from January to June, 1840. The general belief is, that it will not be possible under any plan, however rigorous, to check the smuggling of opium into China.

I. An account of the quantity of Opium imported, exported, and cleared for consumption in the United Kingdom.

Cleared for Consumption. Years.		lbs.	Cleared for Consumption. Years.		lbs.
1820	(duty 9*s.*)	16,169	1830	.	22,668
1821	.	18,080	1831	.	25,937
1822	.	18,391	1832	.	30,258
1823	.	20,985	1833	.	35,407
1824	.	22,752	1834	.	28,467
1825	.	20,582	1835	.	31,247
1826	.	28,329	1836	(duty 1*s.*)*	38,943
1827	.	17,322	1837	.	37,487
1828	(duty 4*s.*)	20,680	1838	.	30,435
1829	.	23,970			

Average Annual Quantities at various periods, each year inclusive:—

	Imported. lbs.	Exported. lbs.	Home Consumption. lbs.
From 1796 to 1798 (Great Britain)	13,068	2,037	11,029
„ 1798 to 1801 (ditto)	21,715	2,792	18,297
„ 1820 to 1827 (United Kingdom)	71,714	40,848	20,311
„ 1829 to 1834 (ditto)	81,852	56,868	27,784

II.—Consumption and Value of Indian Opium in China.

From April 1 to March 31.	Patna and Benares. Chests.	Malwa. Chests.	Total Chests.	Total Value. Dollars.
1816-17	2610	600	3210	3,657,000
1821-22	2910	1,718	4628	8,314,600
1826-7	3661	6,308	9,969	9,610,085
1827	5134	4,401	9,535	10,425,075
1828	5965	7,771	13,132	12,533,115
1829	7143	6,857	14,000	12,057,157
1830	6660	12,100	18,760	12,904,263
1831	5960	8,265	14,225	11,501,584
1832	8267	15,403	23,670	15,332,759

Average annual number of chests of Patna and Benares and Malwa, from 1816 to 1823, 4455; from 1824 to 1831, 11,953.

Average price per chest.—From 1816 to 1823, Patna and Benares, 1446 dollars; Malwa, 1073 dollars. From 1824 to 1831, Patna and Benares, 965 dollars; Malwa, 862 dollars.

Range of Prices from 1816 to 1832—Patna and Benares,

* From August 13th.

highest price per chest, 2550 dollars, in 1822-3; lowest, in 1830-1, 790 dollars: Malwa, highest price, in 1820-1, 1800 dollars; lowest price, in 1830-1, 620 dollars.

OPOPO'NAX CHIRO'NIUM (Koch), a native of the south of Europe, and also of Asia Minor, a tall plant often eight feet high, from the base of the stem or summit of the root of which, when wounded, flows a yellow milky juice, which hardens on exposure to the sun and air. It occurs either in tears or in masses called placentæ. The tears are globose or angular, fatty to the touch, externally brownish-yellow, fragile, and, on being triturated, yielding a yellow powder. The odour is strong, somewhat nauseous, resembling ammoniacum with a bitter balsamic taste. The specific gravity is 1·622.

Its constituents are resin, gum, and volatile oil. In its action on the human system it corresponds with the other gum resins of the Umbelliferæ. [ASSAFŒTIDA.] The Ferula Hooshee, a native of Beloochistan, produces a gum called hooshee, which, though not collected, resembles the Opoponax of the European shops. (Royle, *Flora of the Himalaya*, p. 231.)

OPORTO (O PORTO, 'the Port'), the largest city in Portugal, Lisbon excepted, and a seaport in the province of Entre-Douro-é-Minho, is situated on the declivity of a hill in an elevated situation on the northern bank of the river Douro, and about three-fourths of a league, or two English miles, from its mouth, in 41° 11′ N. lat., 8° 40′ W. long., about 160 miles north of Lisbon. Seen from the river, the city presents a very striking and romantic appearance; the houses, being all white-washed, give it an air of excessive cleanliness, but, on a closer inspection, most of the streets, especially those on the declivity of the hill, are found to be narrow, crooked, and dirty. Oporto is, however, on the whole, considered to be the cleanest city in Portugal. It contains many broad straight streets, with a number of new and handsome houses, having gardens attached to them filled with vines and orange-trees. In one of the principal thoroughfares is situated the English factory-house, a large handsome building, erected about twenty years ago, in which the British consul has his office. It is a sort of club-house, designed to bring merchants and foreigners together, and contains a fine library, a reading-room, and a spacious ball-room. The steep declivity of the hill on which the town is built makes it a very laborious task to ride on horseback or in carriages, although this inconvenience has been somewhat remedied by recent improvements. On the east side of the town, houses are built against so steep a part of the declivity over the stream, that they can only be approached by steps cut out of the rock.

The river affords a tolerably secure harbour without any artificial aid except an elevated and walled quay, to which the ships' cables may be fastened during the floods, which often come down with such force, that, without this support, the vessels would inevitably be carried out into the sea. The mouth of the Douro is however obstructed by rocks and quicksands, which render its entrance difficult. This obstacle once surmounted, the river is well adapted to the purposes of trade, being very deep in front of the town. Two-masted vessels can come close to it, those with three masts within a quarter of a league, and the large Brazilian ships alone used to unload their cargoes in the road. The quay, which is of a simple construction, extends the whole length of the town.

Oporto was occasionally the residence of the antient kings of Portugal, until Alfonso I., assisted by a fleet of English crusaders under the command of William Longsword, wrested Lisbon from the hands of the Almoravides, in October, 1147. During the middle ages Oporto was famous for the strength of its fortifications; it is now partly surrounded by an old wall five or six feet thick, flanked at intervals by strong towers. To the westward, along the declivity of the hill, is the market town of Gaya, where, in antient times, a place named *Cale*, mentioned by old writers, is said to have stood. Oporto being afterwards built, and being found more convenient for ships owing to the greater depth of the river, the former was abandoned by its inhabitants, who migrated to the latter. Hence the name of Oporto, or *Portus Cale*, that is, the harbour of Cale, whence *Portucal*, and at last Portugal, were derived. To the east lies the considerable and populous town of *Villanova do Porto*, chiefly inhabited by wine-coopers and other people employed by the merchants of Oporto; and between that town and Gaya, on a small plain along the bank of the river, are the immense vaults, or lodges, as they are there called, where the wine is kept till it is stored. Between the village where these vaults are and Oporto there is a communication across the river by a bridge of boats, the expense of which is defrayed by each person paying a small copper coin as he passes and repasses. All communication is however suspended during a few weeks in the spring, when the river is so much swollen by the heavy rains and the melting of the snow on the mountains of Spain, that the water often rises to the height of twenty feet, as in 1820, when it did incalculable damage to the shipping then in the river. On a rocky eminence near Villanova is the celebrated convent and garden called Mosteiro da Serra, which once belonged to the religious order of Austinian monks. It was there, during the Peninsular War, that the British crossed the Douro under a tremendous fire from the batteries erected by the French on the north side, and it was from there also that in 1832 Don Pedro, aided by the British, repulsed the royalist troops commanded by the usurper Don Miguel.

Oporto contains four suburbs—Mazarelos, Cedofeita, Santo Ovidio, and La Lapa, which, together with the city, cover an extent of ground of about two miles. It has 11 public squares called *campos*, of which the most spacious are As Ortas, San Roque, and Vitoria; 14 hospitals, or charitable asylums; 90 churches, besides a fine and spacious cathedral rebuilt by Henry of Besançon, first count of Portugal, A.D. 1105; and 17 monasteries, now uninhabited, the religious orders having been, in Portugal as well as in Spain, suppressed since the establishment of the liberal system. It is the see of a bishop, who resides chiefly at Mezaufrio, but has a very fine modern-built palace within the city. A theatre, in the highest part of the town, built by an Italian architect named Mazzolleschi, is very much admired.

The principal trade of Oporto consists in wine, white or red, but chiefly the latter, which is made in the province of Tras-os-Montes, to the north-west, and in some districts of Entre-Douro-é-Minho, to the north. It is exported in large quantities to various parts of Europe and America, but the greatest consumption is that of this country, where it is known as 'Port wine.' The amount yearly exported varies from 50,000 to 70,000 pipes. There are other articles of export, such as oil, sumach, linen, lemons, and oranges, of which last fruit no less than nine millions were exported in 1789. The imports are woollen, cotton, iron, and hardware manufactures, mainly from England; salt-fish, hemp, and flax; wheat and rice from the United States. There are also at Oporto some manufactures of hats, silks, linen stuffs, and pottery, besides ropewalks and dockyards, none of which however are in a thriving condition.

The population of Oporto is stated by Murphy at 63,000 souls; but he no doubt forgot to include the two annexed towns of Villanova and Gaya, which in 1827 made it amount to eighty thousand. That number however must have diminished rather than increased by the loss of the Portuguese colonies, a death-blow to the commerce of Oporto, as well as by the ravages of war to which the town has been subjected since the beginning of the present century. It was first taken and sacked by the French during the Peninsular war. It became afterwards, in 1831-33, the scene of a fierce contest for the throne of Portugal, between Don Pedro, the ex-emperor of Brazil, and his brother Don Miguel, who had usurped the crown from his niece Doña Maria. During the siege, which lasted upwards of one year, the town of Oporto was partly destroyed by the artillery of the assailants, and several wealthy mercantile houses were entirely ruined by the complete stoppage of trade, and the wanton destruction of property by the troops of the usurper, who, on their retreat from before the lines of Oporto, blew up with gunpowder several wine-cellars belonging to the merchants of the city.

The climate of Oporto is damp and foggy in winter, in consequence of its mountainous situation; but although, owing to the above circumstance, the air is cooler than anywhere else in Portugal, it seldom freezes. In summer the heat is excessive, especially in the narrow valley formed by the hills on the southern declivity of which Oporto is situated. Most of the plants of the Cape of Good Hope grow in the open air, as well as gooseberries, currants, and other fruits of the colder countries of Europe. The soil, though well cultivated, is not fertile, and few of the productions which are annually exported by the Douro are grown within any short distance of the town. The dress of the inhabitants

somewhat differs from that of the southern provinces, and the peasants use wooden shoes. (Miñano; La Clède, *Histoire Générale de Portugal*, vol. ii.; Link's *Travels*.)

OPOSSUM. The term *Opossums* is generally used to designate the *Didelphidæ*, now confined to the American continents. The former existence of this type in Europe in association with *Palæotherium*, *Anoplotherium*, and other extinct pachydermatous quadrupeds, is proved by the fossil remains in the Paris basin (Eocene of Lyell).

The dentition of these scansorial Marsupials bears more resemblance to that of the *Bandicoots* (*Perameles*) than to that of the *Dasyuri*, if the structure of the molar teeth be excepted.

The whole of this subfamily have the inner toe of the hind foot converted into a thumb, destitute however of a claw, and this development is apparent in nearly all the species which have a scaly prehensile tail. Professor Owen remarks that in some of the smaller *Opossums* the subabdominal tegumentary folds are rudimental, or merely serve to conceal the nipples, and are not developed into a pouch; and in these the young adhere to the mother by entwineing their little prehensile tails around hers, and clinging to the fur of her back; whence the specific name *dorsigera*, applied to one of the species. He further observes that few facts would be more interesting in the history of the Marsupialia than the condition of the new-born young, and their degree and mode of uterine development in these Opossums. Since the Marsupial bones serve not, as is usually described, to support a pouch, but to aid in the function of the mammary glands and testes, they are, he adds, of course present in the skeleton of these small pouchless Opossums, as in the more typical Marsupials. (Professor Owen's interesting paper *On the Classification of the Marsupialia*, in *Zool. Trans.*, vol. ii., part iv.; and the article MARSUPIALIA.)



Didelphys dorsigera.

(From the specimen in the British Museum.)

OPPELN is one of the four governments of the Prussian province of Silesia, and comprises the greater part of what was formerly called Upper or Higher Silesia, from its almost wholly consisting of hills and mountains. It is bounded on the north-west by the government of Breslau, on the east by the kingdom of Poland and the republic of Cracow, on the south-east by Galicia, and on the south and south-west by Austrian Silesia. Its area is 5000 square miles, and it is divided into ten circles. It has extensive forests of fine timber, and abounds in valuable minerals. This part of the province is less fertile and much colder than Lower Silesia. The snow falls early and lies late, so that the inhabitants are obliged to use snow-shoes and sledges. The old Sclavonic dialect, still in use in some parts of the province, is almost wholly confined to these mountains. The Roman Catholic religion preponderates more than in any other part of Silesia. Of a population of 740,000, only a fifteenth part are Protestants.

There are some manufactures in the government; and a considerable export trade in the natural products of the country is carried on by means of the Oder, which traverses the country in its whole extent.

OPPELN, the capital of the government, is situated in 50° 36′ N. lat. and in 17° 57′ E. long. It is a walled town with four gates, and is situated on the Oder, in which there is an island called Paschcke, which is laid out like a park, and contains some dwelling-houses, a coffee-house, and a bathing-house. The island is connected with the left bank by the great bridge, and with the town by two bridges over an arm of the Oder. The public buildings are not remarkable. There are several churches, a synagogue, a gymnasium, a town-hall, some schools, an hospital, and other charitable institutions. The population, according to the latest census (to 1st January, 1839), is 6821. Besides tanneries and manufactories of earthenware, there are manufactures of linen, tape, and leather. The town has a good trade in timber, zinc, lead, calamine, hardware, leather, woollen cloths, and Hungary wines.

(Müller's *Handbuch*, 1836; Fischer's *Handbuch über Schlesien*, 1817; Hassel's *Handbuch*; *Preussische Staats-Zeitung*, 1839, which gives the latest official returns of the population.)

OPPENHEIM is the capital of a district of 20 parishes, with 15,000 inhabitants, on a steep declivity on the left bank of the Rhine, in the grand-duchy of Hesse Darmstadt, on the site of the Roman Bauconia. The inhabitants, 2400 in number, carry on a considerable trade by the Rhine. Oppenheim has one Roman Catholic and one Protestant church, four hospitals, and a Protestant consistory. This town was formerly a free imperial city, and a diet was held in it in 1076. It was a place of some celebrity in the Thirty Years' War, when it was almost destroyed by Gustavus Adolphus, and afterwards in 1689 by the French under Melac. The beautiful cathedral of St. Catherine, a monument of German architecture of the thirteenth century, and an imitation on a smaller scale of the cathedral of Cologne, still lies partly in ruins. The ruins of Landscronenburg and the Swedish pillar are worthy of notice. In the vicinity of Oppenheim is the romantic Nierstein, called by the Romans Neri, famous for its wine; and in the celebrated Wonnegau (which may be translated the Vale of Delight) is the spa called Sironabad, which was known to the Romans, and has been again in use since 1802.

OPPIAN (Ὀππιανός), an eminent grammarian and poet of Cilicia (Hieronymus, in *Ezek.*, 47; Athen., *Deipnos.*, lib. i., p. 13 b., ed. Casaub.), two of whose works are still extant under the titles 'Cynegetica' and 'Halieutica.' His father's name was Agesilaus, and his mother's Zenodota, but as to the time and place of his birth authorities are not quite agreed. Syncellus (*Chronogr.*, p. 352, 353) and Jerome (in *Chronic.*) place him in the reign of Marcus Aurelius Antoninus; but Sozomen (*Præfat. ad Hist. Eccles.*), Suidas (in voce Ὀππιανός) and others state him to have lived in the time of Severus; and though Oppian in both his poems (*Halieut.*, lib. i., v. 3; and lib. iv., v. 5; *Cyneget.*, lib. i., v. 3) addresses the emperor by the name 'Antoninus,' it is probable that Caracalla is meant, as this appellation was conferred upon him when he was associated with his father in the empire, A.D. 198 (Herodian, lib. iii., cap. 10), and is the name by which he is commonly designated by the antient historians, Herodian, Dion Cassius, &c. As to his birth-place, Suidas supposes it to have been Corycus, but the anonymous author of the Greek life of Oppian and most other authorities say that he was born at Anazarba, a city which also gave birth to Dioscorides. Stephan Byzant., in voce Ἀναζαρβά.) Indeed Oppian himself seems to refute the assertion of Suidas, for in the third book of the 'Halieutics,' v. 205, sq., he distinguishes his fellow-countrymen from their neighbours the Corycians. His father appears to have been a person of some consideration in his native city, for he was banished to the island of Melita in the Hadriatic by Severus, for suffering himself to be so entirely engrossed by his philosophical studies as to neglect coming in person along with his fellow-citizens to pay his respects to the emperor when, in taking a progress through Cilicia, he made his entrance into Anazarba. He was accompanied in his exile by his son Oppian, who had enjoyed the advantage of an excellent education under the superintendence

of his father, and who now began to devote himself to poetry. Accordingly he composed his poem on fishing, and presented it either to the emperor Severus (Sozomen, *Præfat. ad Hist. Eccles.*), or more probably (Suidas, in voce Ὀππιανὸς; Oppian, *Halieut.*, i. 3; iv. 5) to his son Caracalla, who was so much pleased with it, that he not only repealed the sentence of his father's banishment, but also presented him with a piece of gold for each verse that it contained.* He died of the plague shortly after his return to his native country, at the early age of thirty; leaving behind him three poems, on Hawking (Ἰξευτικά), Hunting (Κυνηγετικά), and Fishing (Ἁλιευτικά).

The 'Ixeutics' consisted of two books according to Suidas, or rather of five, according to the anonymous Greek author of Oppian's life, and are no longer extant, but a Greek Paraphrase in Prose, by Eutecnius, of three books, was published, Havniæ, 1702, 8vo., Gr. and Lat., ed. E. Windingius, which is also inserted in Schneider's edition of Oppian, Argent., 8vo., 1776.

The 'Cynegetics' are written in hexameter verse, consist of about 2100 lines, and are divided into four books: they display a very fair knowledge of natural history, with which however a good many absurd fables are mixed up. He says expressly that the tusks of the elephant are not teeth but horns (lib. ii., v. 491, sq.), and mentions a report that these animals are able to *speak* (v. 540, sq.): he states that there is no such thing as a *female* rhinoceros, but that all these animals are of the *male* sex (v. 563); that the lioness when pregnant for the first time brings forth five whelps at a birth, the second time four, the next three, then two, and lastly only one (lib. iii., v. 58, sq.); that the bear brings forth her cubs half formed and licks them into shape (v. 159, sq.); that so great is the enmity between the wolf and the lamb, that even after death, if two drums be made of their hides, the wolf's hide will put to silence the lamb's (v. 282, sq.); that the hyænas annually change their sex (v. 288, sq.); that the boar's teeth contain fire inside them (v. 379, sq.); that the ichneumon leaps down the throat of the crocodile while lying asleep with its mouth wide open, and devours its viscera (v. 407, sq.). [ICHNEUMON.] He thinks it necessary to state expressly that it is *not* true that there are no *male* tigers (v. 357, sq.). He gives a very spirited description of the giraffe, 'the exactness of which,' says Mr. Holme ('Earlier Notices of the Giraffe,' in 'Trans. of the Ashmol. Soc.,' vol. ii.), 'is in some points remarkable; particularly in the observation that the so-called horns do not consist of horny substance (οὔτι κέρας κερόεν); and in the allusion to the pencils of hair (ἀβληχραὶ κεραῖαι) with which they are tipped.' He adds, 'That the animal must have been seen alive by Oppian is evident from his remark on the brilliancy of the eyes, and the halting motion of the hinder limbs.'

The 'Halieutics' are also written in hexameter verse, and consist of five books, of which the two first contain the natural history of fishes, and the three last the art of fishing. In this poem, as in the 'Cynegetics,' the author displays considerable zoological knowledge, though it contains several fables and absurdities,—more perhaps than we meet with in Aristotle, but certainly not so many as in Pliny and Ælian. He mentions (lib. i., v. 217, sq.) the story of the Remora, or sucker (ἐχενηΐς), being able to stop a ship when under full sail by sticking to the keel, and reproves the incredulity of those who doubt its truth (*Plut. Sympos.*, lib. ii., Quæst. 7); he was aware of the peculiarity of the Cancellus, or hermit-crab (καρκινάς), which is provided with no shell of its own, but seizes upon the first empty one it can find (v. 320, sq.); he gives a beautiful and correct description of the Nautilus (v. 338, sq.); he says that the Muræna, or lamprey, copulates with land serpents, which for the time lay aside their venom (v. 554, sq.); he notices the numbness caused by the touch of the Torpedo (νάρκη) (lib. ii., v. 56, sq.; and lib. iii., v. 149, sq.); and the black fluid emitted by the Sepia or cuttle-fish, by means of which it escapes its pursuers (lib. iii., v. 156, sq.); he says that a fish called Sargus (σαργος) copulates with goats, and that it is caught by the fisherman's dressing himself up in a goat's skin, and so enticing it on shore (lib. iv., v. 308, sq.); he several times mentions the dolphin, calls it, for its swiftness and beauty, the king among fishes (as the eagle among birds, the lion among beasts, and the serpent among reptiles) (lib. ii., v. 533, sq.), and relates an anecdote, somewhat similar to those mentioned by Pliny (*Hist. Nat.*, lib. ix., cap. 8), and which he says happened about his own time, of a dolphin that was so fond of a little boy that it used to come whenever he called it by its name, and suffered him to ride upon its back, and at last was supposed to have pined away with grief on account of his death (lib. v., v. 448, sq.).

The 'Halieutics' are much superior to the 'Cynegetics' in point of style and poetical embellishment, and it is partly on account of this great disparity that it has been supposed that the two poems were not composed by the same person. But there are other and stronger reasons in support of this opinion (which was first put forth by Schneider in the preface to his first edition of Oppian's works), rendering it almost certain that, though by the universal consent of antiquity Oppian wrote a poem on hunting, yet it cannot be that which now goes under his name. Oppian was (as we have seen) a Cilician, but the author of the 'Cynegetics' tells us distinctly, in two different passages, that his native place was a city on the Orontes in Syria (probably Apamea), (lib. ii., v. 125-127, and ibid., v. 156, 157). This has been denied by Belin de Ballu, who published an edition of the 'Cynegetics,' Argentor., 1786, 4to. and 8vo., Gr. and Lat., and who (as Dibdin says) 'seems to have entered upon the task almost expressly with a determination to oppose the authority and controvert the positions of Schneider;' but it is only by altering the text in both passages (and that too not very skilfully) that he has been able to reconcile them with the commonly received opinion that the poem is the work of Oppian. In Schneider's second edition he continues to hold the same opinion, and replies to the objections of Belin de Ballu. It appears, from an allusion to fishing and the sea deities, in the first book of the 'Cynegetics' (v. 77-80), that this poem was composed after the 'Halieutics,' and as a sort of supplement or companion to it; and this has tended to confirm the common opinion that both poems were written by the same author.

With regard to the poetical merits of Oppian, he seems to be one of those poets whose works have been more praised than read. Julius Cæsar Scaliger pronounces him 'to be a sublime and incomparable poet, the most perfect writer among the Greeks, and the only one of them that ever came up to Virgil.' (*Poet.*, lib. v., cap. 9.) Sir Thomas Browne calls him 'one of the best epic poets,' and 'wonders that his elegant lines should be so much neglected' (*Vulgar Errors*, book i., chap. viii.); and, if, as Rapin says, he is sometimes *dry* (*Réflex. sur la Poétique*, p. 176), it may fairly be accounted for and excused when we consider the unpropitious nature of his subject. His style is florid and copious, the language upon the whole very good, though (as was noticed by Dan. Heinsius, *Ad Nonni Dionysiaca*, p. 197), it is now and then deformed by Latinisms.

The first edition of the 'Halieutics' was published Florent., 1515, 8vo., Gr., ap. Ph. Juntam. A Latin translation in hexameter verse, by Laurentius Lippius, was published 1478, 4to. They were translated into English verse by Diaper and Jones, Oxford, 8vo., 1722; into French by Limes, Paris, 8vo., 1817; and into Italian by Salvini, Firenze, 8vo., 1728. The 'Cynegetics' were first published (together with the 'Halieutics') Venet., in Ædib. Aldi, 8vo., 1517. They were translated into Latin verse by Bodin, Paris, 4to., 1555; into English by Mawer, Lond., 8vo., 1736 (containing the first book only); into French by Florent Chrestien, Paris, 4to., 1575, and by Belin de Ballu, Strasb., 8vo., 1787; into German by Lieberkühn, Leipz., 8vo., 1755; and into Italian, with the 'Halieutics' noticed above, by Salvini. Fabricius states (*Biblioth. Gr.*), on the authority of Lambecius, that a paraphrase both of the 'Cynegetica' and of the 'Halieutica,' in Greek prose by Eutecnius, still exists in MS. in the library at Vienna. The last and (as far as it goes) the best edition of Oppian's two poems is Schneider's second edition, which unhappily is unfinished, 8vo., Lips., 1813, Græcè, with a Latin verse translation of the 'Cynegetica,' by Pfeifer, published for the first time though executed in 1555. The most complete edition is that published by Schneider, Argentor., 1776, Gr. and Lat., 8vo., containing also the paraphrase of the 'Ixeutics,' by Eutecnius, men-

* Suidas says 'twenty thousand,' but he must have counted the verses contained in *all* Oppian's poems, as the 'Halieutics' consist of only about 3500; for which, if we reckon the *aureus* to be equal to twenty-five denarii, and worth (according to Hussey, 'Antient Weights and Money, &c.') 15s. 7½d., he must have received about 2734l. 7s. 6d. If (according to the common computation) we take the *aureus* to be worth 16s. 1½d., it would amount to 2825l. 10s. 5d. In either case they might well be called χρύσεα ἔπη, 'golden verses!' Sozom., *loco cit.*

tioned above. Schneider published some addenda to this addition in his *Analecta Critica*, 8vo., Francof., 1777; Fascic. i., p. 31, sq.

OPPOSITION. [CONJUNCTION AND OPPOSITION.]

OPTICS is that branch of physical science which explains the formation of images, as depending on the known laws by which the modifications of light are governed. [LIGHT.] These images are formed either by polished reflecting surfaces or by transparent refracting media. In the former case the angles of incidence and reflection are equal; in the latter the sines of the angles of incidence and refraction are in a constant ratio for one and the same medium. The position and magnitude of the image of an object is easily ascertained, when we have previously ascertained the position of the image of a point, in reference to the position of the point itself and of the reflecting or refracting instrument; in other words, when we have found the relation between the conjugate *foci*, so called because it universally holds in optics, that whichever focus be considered the object, the other will be the image. The *principal focus* of an instrument is that to or from which a pencil of parallel rays falling perpendicularly (or nearly so) on the instrument is made to converge or diverge after reflexion or refraction. In a plane mirror the conjugate foci are similarly situated at opposite sides of the mirror [LIGHT]; consequently in this instance the instrument has no principal focus. Generally the distance of the principal focus from the instrument is called the focal length of that instrument, whether a reflector or a refractor. Since conjugate foci are mutually such, it follows that rays proceeding from the principal focus will, after reflexion or refraction, emerge in a *parallel* pencil. We shall now proceed to the relations existing between the conjugate foci of spherical reflectors, observing that the axis of the instrument is the right line containing the centre of the spherical surface and the conjugate foci. The rays under consideration are those which are directed nearly along the axis, and which therefore fall exceedingly nearly perpendicularly on the reflector.

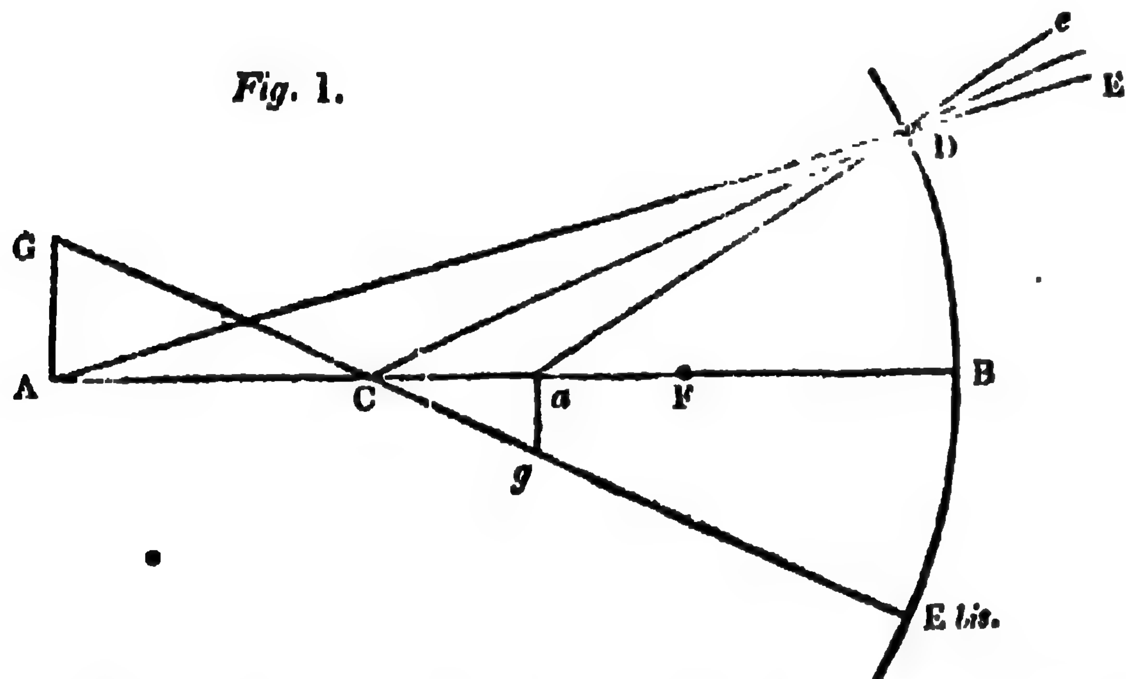


Fig. 1.

Let DBE represent the section of a spherical reflector made by a plane passing through its axis, C its centre, A the focus of incident rays, AD an incident ray, ADC is the angle of incidence; make the angle aDC=ADC, then aDC is the angle of reflection, and if the point of incidence D were infinitely near to the point B in the axis, then all the reflected rays of which the incidence was nearly perpendicular would converge to a, the latter would then be the focus conjugate to A, for if rays diverged from a they would after reflexion evidently converge to A.

Now if a straight line as CD bisect an angle of a triangle, as the angle ADa, it will divide the base into segments AC, Ca proportional to the adjacent sides AD, Da (Euc., book vi.), that is, AC : Ca :: AD : Da, but when D is infinitely near to B we may write AB and Ba instead of AD and Da, in which case we should have AC : Ca :: AB : Ba. Let AB $= \Delta$, aB $= \Delta'$, and the radius CB $= r$; then AC $= \Delta - r$; C$a = r - \Delta'$; whence $\Delta - r : r - \Delta' :: \Delta : \Delta'$, or $\Delta'(\Delta - r) = \Delta(r - \Delta')$; therefore $2\Delta\Delta' = r(\Delta + \Delta')$, which may be also written in the form $\frac{1}{\Delta} + \frac{1}{\Delta'} = \frac{2}{r}$. We should have precisely the same investigation if we had supposed rays as ED to fall on the convex side converging to a focus A; but being reflected in the direction De, they would appear to diverge from the conjugate focus a: hence the above formula applies to two cases, viz. when diverging rays fall on the concave surface, or converging rays on the convex surface, of a spherical reflector.

Example 1.—A candle is placed before a concave speculum at a distance of 3 feet from it: what will be the distance of its image from the same, the radius of the speculum being 2 feet?

Here, we have given $\Delta = 3$ feet, $r = 2$ feet, and to find Δ' we substitute these numbers in the general formula $\frac{1}{\Delta} + \frac{1}{\Delta'} = \frac{2}{r}$ which thus becomes $\frac{1}{3} + \frac{1}{\Delta'} = \frac{2}{2} = 1$; whence $\frac{1}{\Delta'} = \frac{2}{3}$ and therefore $\Delta' = \frac{3}{2} = 1\frac{1}{2}$ foot; the image will consequently be 1 foot 6 inches in front of the speculum.

It being sometimes convenient to measure the distances of the foci from the centre instead of the surface of the speculum, it is easy to find a proper formula from the proportion we have established, viz. AC : Ca :: AB : Ba. Let AC$=\rho$, C$a=\rho'$; then AB$=r+\rho$, aB$=r-\rho'$, whence $\rho : \rho' :: r+\rho : r-\rho'$, or $\rho(r-\rho') = \rho'(r+\rho)$ therefore $r(\rho-\rho') = 2\rho\rho'$ consequently $\frac{1}{\rho'} - \frac{1}{\rho} = \frac{2}{r}$; thus in the example given above we find (since $\rho = 1$ and $r = 2$) $\frac{1}{\rho'} - 1 = 1$, or $\frac{1}{\rho'} = 2$; therefore $\rho' = \frac{1}{2}$, which is agreeable with the former result.

When the incident rays proceed from a point exceedingly distant (as the sun, for instance) then Δ being very great $\frac{1}{\Delta}$ will be exceedingly small and may be rejected, in which case we have $\frac{1}{\Delta'} = \frac{2}{r}$ or $\Delta' = \frac{r}{2}$, that is, parallel incident rays are made after reflexion to converge to F, the middle point of the radius CB. Hence the focal length of a spherical speculum is one half that of its radius.

In examining the formula for the positions of the conjugate foci, viz. $\frac{1}{\Delta} + \frac{1}{\Delta'} = \frac{2}{r}$ we find that when $\Delta = r$ we also must have $\Delta' = r$; hence when the focus A is at C the centre, the conjugate focus a will be at the same point. If A move to the left of C (in the *fig.*) Δ being then greater than r, $\frac{1}{\Delta}$ is less than $\frac{1}{r}$ and therefore $\frac{1}{\Delta'}$ must be greater than $\frac{1}{r}$ or Δ' is less than r, and as Δ increases to greater magnitudes, Δ' accordingly diminishes, until Δ becomes infinite, when Δ' as we have seen becomes $\frac{r}{2}$; hence whilst A moves on the left indefinitely from C, the other focus moves on the right from C as far as the principal focus F.

With respect to the images formed by concave specula, let AG represent a small object at A; join GC, then GCE will be the axis of the speculum when G is considered the focus of incident rays, and its conjugate focus g can be found by the preceding formula; hence ag will be the image if AG, its position is evidently inverted, and by similar triangles, the linear dimensions of the image ag are to those of the object AG as Cg : CG or as $\rho' : \rho$. Now the formula $\frac{1}{\rho'} - \frac{1}{\rho} = \frac{2}{r}$ gives $\frac{\rho'}{\rho} = \frac{r}{2\rho + r}$; hence the image (in respect to linear dimensions) is less than the object in the ratio of $r : 2\rho + r$ (or since $\rho = \Delta - r$) as $r : 2\Delta - r$; on the contrary, if the object be placed between the centre and principal focus, as at ag, then AG would become the image; for AG : ag :: $\rho : \rho'$; but $\frac{\rho}{\rho'} = \frac{r}{r - 2\rho'} = \frac{r}{2\Delta' - r}$; therefore AG : $a'g$ :: $r : 2\Delta' - r$; which shows that the image is then greater than the object, or magnified. From the principles of geometry it follows that the surfaces of the image and object are as the squares of the linear dimensions, and the apparent volume, or bulk, as their cubes.

Example 2.—An object is placed at a distance of 12 feet in the axis of a concave speculum of two feet radius: to find how much it will appear diminished in its image, with respect to its linear, superficial, and solid dimensions.

Here $r = 2$, $\Delta = 12$, $2\Delta - r = 22$; therefore

for linear dimensions Image : Object :: 2 : 22,
that is :: 1 : 11;
for superficial do. the ratio is as 1 : 121, and for apparent bulk it is as 1 : 1331.

Heat being capable of reflection, like light, the rays of the

sun may be collected by a concave speculum in its principal focus (or burning-point) F.

Example 3.—To find how much an object will be magnified by the same speculum, when placed 1 foot 6 inches in front of it.

Here $\Delta'=1\frac{1}{2}$, $r=2$, $2\Delta'-r=1$; therefore in linear dimensions the ratio is as 2 : 1;
in superficial as 4 : 1;
and in cubical as 8 : 1.

Let us next consider the relation between the conjugate foci when diverging rays fall on a convex spherical speculum, which will also be the relation when converging rays fall on a concave speculum as will be evident by inspection of the figure (*fig.* 2). Employing the same letters with the diagram as before, C will be the centre, A the focus of incident rays, a of reflected rays, &c.

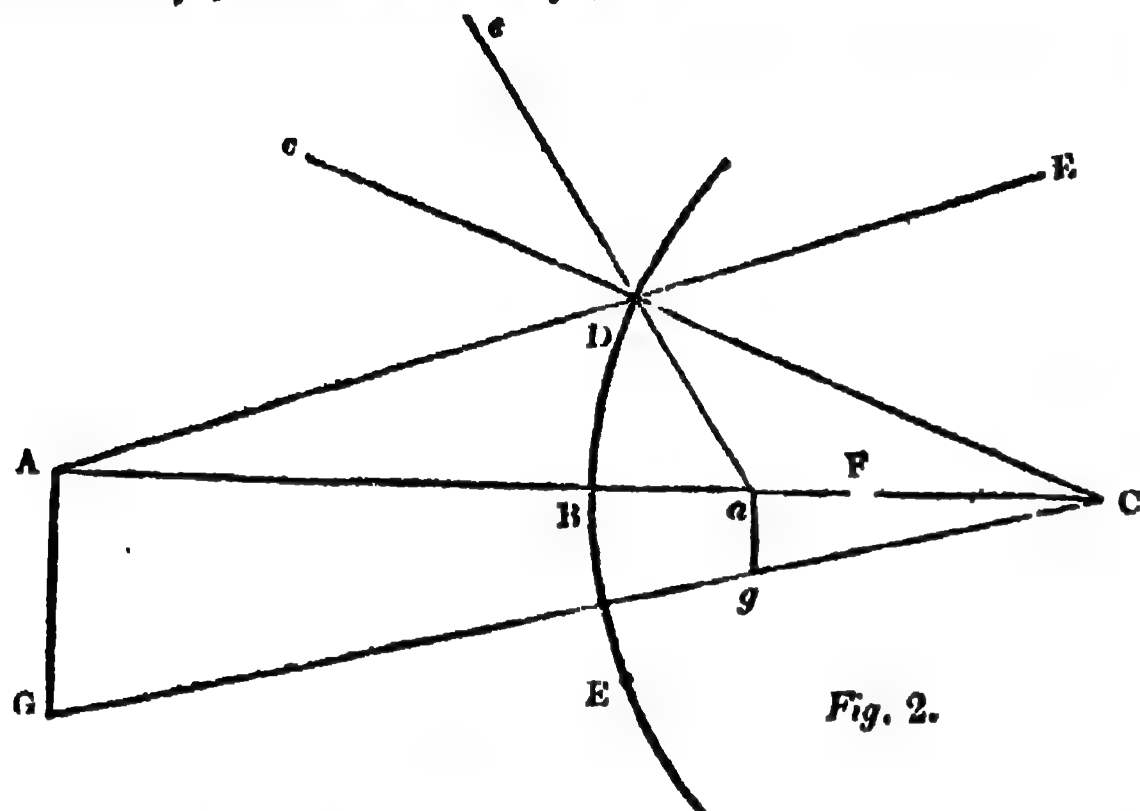


Fig. 2.

Let AD be an incident ray near the axis AC, join CD and produce to c; make the angle of reflexion cDe equal to the angle of incidence ADc, and produce the reflected ray De to meet the axis in a; then when D is infinitely near B, a is the focus conjugate to A. The same figure would equally apply if we had supposed rays ED converging to A to fall on the concave surface, for since the angles ADe, cDe, aDC, CDE are all equal, Da would then be the actual reflected ray and therefore a would be yet the focus conjugate to A. Now since the external angle aDE of the triangle ADa is bisected by the straight line DC, it follows (Simson's *Euc.*, book 6) that AC : Ca :: AD : Da (and D being supposed infinitely near to B in order that the rays may be incident nearly perpendicularly) :: AB : Ba. Let AB=Δ, aB=Δ', CB=r, CA=ρ, Ca=ρ', then we have

$$\rho : \rho' :: \Delta : \Delta', \text{ or } r+\Delta : r-\Delta :: \Delta : \Delta', \text{ hence}$$
$$\Delta'(r+\Delta)=\Delta(r-\Delta'),$$

therefore $2\Delta\Delta'=r(\Delta-\Delta')$ whence $\frac{1}{\Delta'}-\frac{1}{\Delta}=\frac{2}{r}$. Again the same proportion $\rho : \rho' :: \Delta : \Delta'$ may be written $\rho : \rho' :: \rho-r : r-\rho'$; hence $\rho(r-\rho')=\rho'(\rho-r)$ therefore $r(\rho+\rho') = 2\rho\rho'$ whence $\frac{1}{\rho}+\frac{1}{\rho'}=\frac{2}{r}$.

If we suppose $\rho=r$, we find $\rho'=r$, which shows that the foci are together at B, and as ρ increases, ρ' diminishes, until ρ becomes infinite, when $\rho'=\frac{r}{2}$, showing that a will then reach the principal focus F. Hence, in general, the principal foci move in contrary directions, and meet both at the centre and circumference. In the formula just given one of the conjugate foci lies between the principal focus and the surface of the speculum; while in the first set, one lay between that point (F) and the centre.

With respect to images, if AG be the object and g the focus conjugate to G, then ag will be the image of AG; and conversely, if ag be the object, AG will be the image, and their proportion may be easily calculated, for AG : ag :: CA : Ca, that is, as $\rho : \rho'$, or as $\Delta : \Delta'$, which we have seen is the same ratio.

Example 4.—In the concave speculum of two-foot radius, an object is placed within 6 inches of its interior surface: how far will the image appear at the back of the speculum and how much will it seem enlarged?

Here $r=2$ foot, $\Delta'=\frac{1}{2}$ foot, and since $\frac{1}{\Delta'}-\frac{1}{\Delta}=\frac{2}{r}$ we have $2-\frac{1}{\Delta}=1$, therefore $\Delta=1$, or the image will appear a foot behind the convex side and will be enlarged in linear dimensions as Δ to Δ', that is, as 2 to 1; in surface 4 : 1; in volume 8 to 1.

Example 5.—An object is placed 10 feet distance from a convex speculum of 3 feet radius; find the position and magnitude of its image.

Here $r=3$, $\Delta=10$, therefore $\frac{1}{\Delta'}-\frac{1}{10}=\frac{2}{3}$, whence $\frac{1}{\Delta'}=\frac{23}{30}$, therefore $\Delta'=1\frac{7}{23}$ feet, or 1 foot 3 inches, 8 parts nearly, at which distance in the concavity of the speculum the image will seem to be, and (in linear dimensions) Object. Image :: $\Delta : \Delta'$ $10 : \frac{30}{23}$, that is as 23 : 3; the surfaces as 529 : 9, &c. Thus the reader with only a moderate knowledge of simple equations will be able to solve all questions relative to the images of objects formed by spherical specula, concave or convex. The images in the last two examples are erect. Generally the image will be erect or inverted according as one of the conjugate foci is between the principal focus and surface, or between that point and the centre; for it is easily seen that in every case one of the foci is in some part of the radius between the centre and surface.

In the preceding calculations, we have confined ourselves to such rays as fall nearly perpendicularly on the reflecting surfaces. The rays which are at a considerable distance from the axis of a spherical speculum are not reflected accurately to the same point as those incident near the axis; hence arises a diffusion of the reflected rays arising from the sphericity of the speculum and denominated the *spherical aberration;* and when measured *along* the axis, it is called the *longitudinal aberration;* but when perpendicular to it, through the focus, the *lateral aberration.* It will be sufficient in this article to calculate their amount in the most usual case when the incident rays are parallel, as those which proceed from the heavenly bodies.

Let SD represent a ray falling parallel to the axis CB,

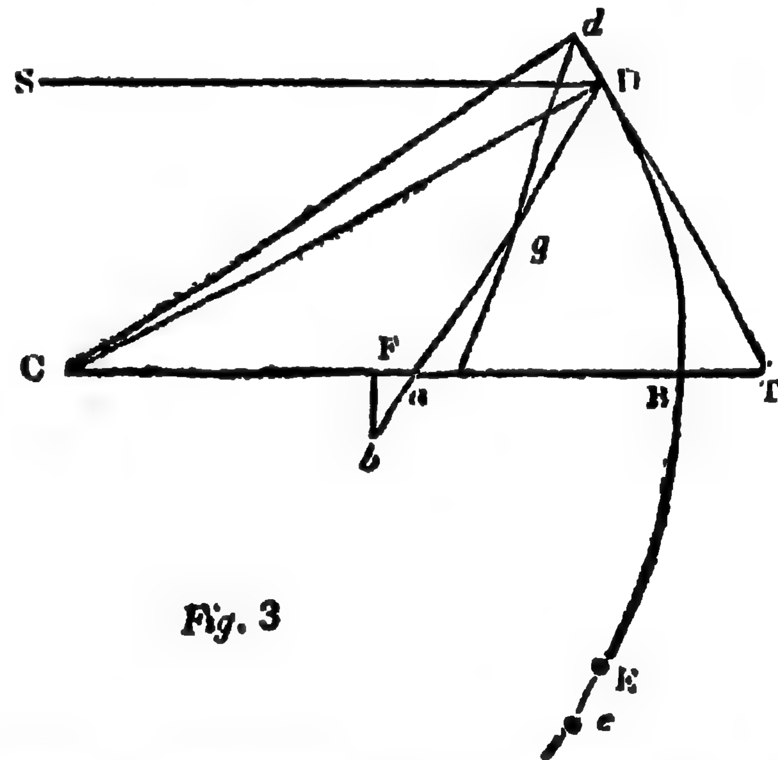


Fig. 3

BD being the intermediate arc of the section of the speculum, Da the reflected ray; if this figure revolve round CB, it is evident that all rays incident on the annulus through which D moves will likewise be reflected to a, which is therefore strictly the focus of that annulus. Now F, the middle point of CB, is the point to which rays falling near the axis are reflected; hence aF is the longitudinal and Fb the lateral aberration corresponding to the above annulus. To calculate the amount of these we may observe that the angle SDC (of incidence) is equal to CDa (of reflexion), and also to DCa (by the theory of parallels); and since the angles aDC, aCD, are thus equal, therefore Ca = aD. Let DT be a tangent at D, then aDT and aTD, being respectively the complements of aDC and aCD, are also equal, whence aT = aD, but also Ca = aD, therefore a is the middle point of CT; and since F is the middle of CB, it follows that aF is the half of BT; thus the longitudinal aberration is known; and since the angle Fab is the the double of DCB, the lateral aberration is from thence known. Let the angle DCB = θ, and radius CB = r, then CT = r sec. θ and BT = r (sec. $\theta - 1$), hence we obtain the exact values of the two aberrations, viz. the longitudinal = $\frac{r}{2}$ (sec. $\theta - 1$), and the lateral Fb = $\frac{r \tan. 2\theta}{2}$ (sec. $\theta - 1$). Hence in order that the aberrations may be inconsiderable, we ought to have the extreme magnitude of

θ, viz. the angle BCd (in *fig.* 3), also small. On this supposition formulæ sufficiently approximate may be deduced from the above and better adapted for practice. For sec. θ put $1 + \frac{\theta^2}{2}$, and for tan. 2θ put 2θ, which are respectively the approximate values; thence we get, longitudinal aberration $= \frac{r.\theta^2}{4} = \frac{BD^2}{4BC}$, and lateral aberration $= \frac{r.\theta^3}{2} = \frac{BD^3}{2BC^2}$, both of which are evidently very small, particularly the latter. The least circle of aberration is the smallest that would be formed on a card placed perpendicular to the axis near the focus F to receive the reflected rays; now if the intersection g of a reflected ray Dg with the final one dg be taken the most remote possible from the axis CB, it is evident that all the other reflected rays will pass between g and the axis, and hence the perpendicular distance from g to the axis is the radius of the circle of least aberration or diffusion. The question is thus reduced to one of maxima and minima, and may be easily solved in the usual manner by means of the Differential Calculus.

We have hitherto considered only such rays as fall nearly perpendicularly on the reflecting surface; but since rays fall at all incidences from a luminous point, each pencil of rays, at whatever incidence, when in the same plane, after reflexion, converges to or diverges from some point (unless reflected parallel); a line of light containing all such points in that plane forms a *caustic* line, and in all possible planes constitutes a caustic surface. Caustics formed by reflexion have been distinguished from those produced by refraction by giving the name of diacaustics to the latter and catacaustics to the former, in the same manner in which that part of optics connected with refraction has been denominated dioptrics, and that with reflexion catoptrics. In both cases the caustic line is the curve which each reflected or refracted ray *touches*: hence the equation to the caustic curve, whether produced by parallel, diverging, or converging rays, is easily obtained by taking the equation to one of the reflected or refracted rays, and then applying the Differential Calculus to find the curve touched by all such straight lines; viz. differentiate the equation to the reflected or refracted ray relatively to the constant in its equation, and then eliminate the constant between the two equations, which will then produce the equation to the caustic. If the sun or a candle shine on a vessel containing liquid, and polished in the interior (such as a china cup of tea), a caustic line of light will be observable on the surface of the liquid, which line is a horizontal section of the caustic surface by that of the liquid.

We now come to the consideration of refracting transparent media; and if we suppose the constant ratio of the sine of incidence to that of refraction to be as $m : 1$, then m is called the index of refraction for the particular medium employed, the incident light being supposed to pass from vacuum. But if the light pass from the medium into vacuum, then the ratio of the sine of incidence to that of refraction would be as $1 : m$, and $\frac{1}{m}$ would be the refractive index; m is evidently greater than unity, since the ray after entering the medium is turned towards the perpendicular, and $\frac{1}{m}$ is less than unity, because after the ray emerges from the medium into vacuum, it is turned from the perpendicular. If m be the index of refraction from vacuum into one medium which we may call A, and m' that from vacuum into a different medium B, then $\frac{m'}{m}$ is the index when the light passes from the medium A to B. [LIGHT.] A table of refractive indices is given in OPTICS, PRACTICAL.

Diverging rays fall from vacuum on the *plane* surface of a uniform and transparent medium: it is required to find the relation between the conjugate foci.

Let A be the focus of incident rays, DBE the surface of the medium, AB a perpendicular on DE, AG an incident ray near this perpendicular, GC (AG produced) the course of the ray if unrefracted, Gc its actual course nearer to the perpendicular than GC, then cG to an eye placed in the medium will appear to proceed from the point a, the conjugate focus; the question is to determine the relative situations of a and A.

Fig 4.

Let AB $= \Delta$, aB $= \Delta'$, and m be the index of refraction; then BAG, the complement of AGB, is equal to the angle of incidence, and BaG to that of refraction. Let these angles be respectively denoted by I and R and BG $= h$; then $h = \Delta$ tan. I, and also to Δ' tan. R, therefore $\frac{\Delta'}{\Delta} = \frac{\text{tan. I}}{\text{tan. R}} = \frac{\text{sin. I}}{\text{sin. R}} . \frac{\text{cos. R}}{\text{cos. I}} = m . \frac{\text{cos. R}}{\text{cos. I}}$; but when C is very near B, the angles I and R are exceedingly small, and their cosines may be taken as units, in which case $\frac{\Delta'}{\Delta} = m$, therefore $\Delta' = m\Delta$; and since m is greater than unity, Δ' is greater than Δ in the ratio of $m : 1$. Conversely, if a ray from a medium bounded by a plane surface pass into vacuum, $\frac{1}{m}$ is then the index of refraction, and we should have $\Delta' = \frac{1}{m} . \Delta$, in which case Δ' is less than Δ. This explains why the bottom of a clear river seems nearer to the surface than it really is by about one-fourth of its true depth.

The image of a straight line in vacuo seen from such a medium will be another straight line; for let AA′ be such a line, produce it to D, and join Da, then since a'B′ : A′B′ : : aB : AB : : m : 1; therefore a' is the focus conjugate to A′, and consequently aa' is the image of AA′. It must however be observed that AA′ must be of small dimensions, in order that the rays reaching the observer's eye may be considered as nearly perpendicular to DE, otherwise the above proportion would require to be modified, and the image would be curved. In the above case the image aa' is more remote from the surface DE than the object; but the contrary happens when the object is in the medium, when the image will be nearer the surface than the object is. Hence many familiar optical phenomena may be understood. Thus, when a shilling is placed in an empty vessel, and the eye is so situated that the sides of the vessel just conceal the shilling, upon pouring into it a small quantity of water the shilling will appear as if raised up and becomes visible. For a like reason the sun and stars are visible before they actually rise above the horizon or set below it; and when a straight stick is partly immersed in water, the image of the immersed part being raised nearer to the surface than the true object, will cause the stick to appear bent or broken, as well as shorter than it really is; but when immersed perpendicularly to the surface, the stick appears to be only contracted about one-fourth of the part immersed, for the image and object are then in one straight line.

As refracting media bounded by a single curved surface rarely if ever can occur in practice, we shall proceed to consider lenses, particularly the double convex lens, as known most generally. For their various species see LENS.

Let DBEB′ represent a plane section of a double convex lens, that plane including the centres CC′ of the bounding surfaces DBE and DB′E; let A (in the *axis* CC′) be the focus of incident, and a of the emergent rays. Let m be the index of refraction for incident, and therefore $\frac{1}{m}$ for emergent rays; and let AGKa represent the track of a ray near the axis; let CB $= r$; C′B′ $= r'$, AB $= \Delta$, aB′ $= \Delta'$, and the thickness BB′ $= t$, we have to determine the relation existing between these quantities. First we have sin AGc = m sin KGc, let GAC $= \theta$, GCA $= \alpha$, and the inclination of KG to the axis be ϕ; while δ is the distance of the point at

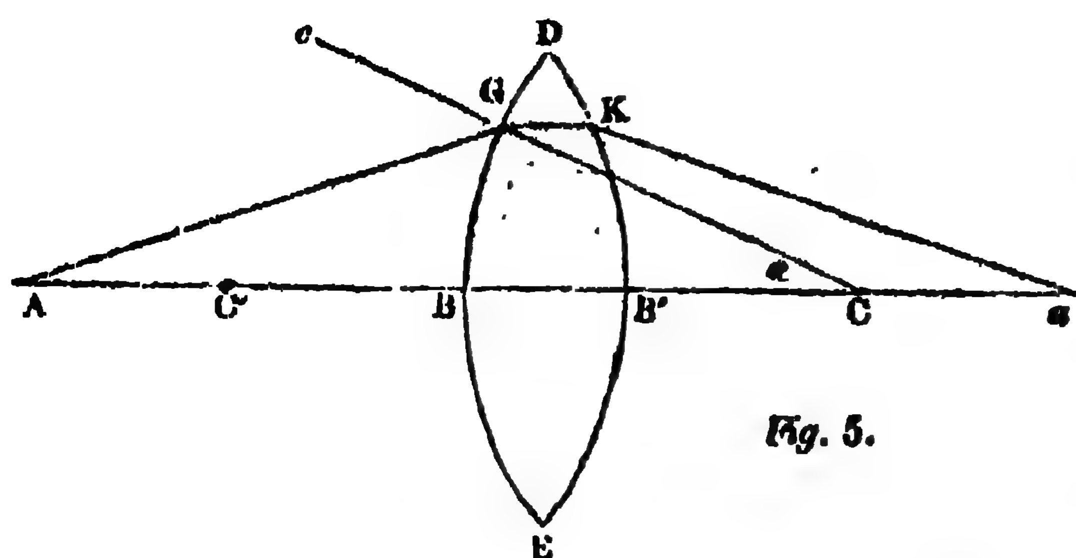


Fig. 5.

which CK cuts the axis from B; then the above equation is the same as $\sin(\theta+a)=m\sin(\phi+a)$, from which, by trigonometry we deduce $\frac{\sin\theta-m\sin\phi}{\sin a}=\frac{m\cos\phi-\cos\theta}{\cos a}$. Now $\frac{\sin\theta}{\sin a}=\frac{CG}{AG}$, of which the ultimate value, when G is at B, is $\frac{CB}{AB}=\frac{r}{\Delta}$, for the same reason the ultimate value of $\frac{\sin\phi}{\sin a}$ is $\frac{r}{\delta}$, and the ultimate values of $\cos\theta$, $\cos\phi$, and $\cos a$ are each unity; therefore we get $\frac{r}{\Delta}-\frac{mr}{\delta}=m-1$, or $\frac{1}{\Delta}-\frac{m}{\delta}=\frac{m-1}{r}$; hence δ, which determines the focus of the first set of refracted rays, is known; and therefore also $\delta+t$, which is its distance from the second surface. Now, since the ray would traverse the same course if we supposed it to commence at a, and proceed through aKG to A, it follows in the same way that $\frac{1}{\Delta'}+\frac{m}{\delta+t}=\frac{m-1}{r'}$, from whence Δ' is known.

If we neglect t as being small, we may eliminate $\frac{m}{\delta}$, and thence obtain $\frac{1}{\Delta'}+\frac{1}{\Delta}=(m-1)\left(\frac{1}{r'}+\frac{1}{r}\right)$; the spherical aberrations may be found by a similar process to that we have employed for reflexion, and the inverse or erect positions of the images ascertained by the like method.

When we have one side plane, we have only to suppose r infinite, and thus one general formula, by proper attention to the signs, may be made to apply to all forms of lenses.

There is a cause of aberration for refracted light, which does not exist for reflected rays, and it is of more consequence in deforming and colouring images than all the effects of spherical aberration. The chromatic dispersion [DISPERSION] arises from the fact that all the coloured rays which compose solar or other light have different refractive indices for one and the same refracting medium; hence the prismatic spectrum, which only consists of successive circular images of the sun, of the different colours of the rays, overlapping each other. This aberration has, by the successive labours of Dollond, Frauenhofer, and others, been successfully combated. [OPTICS, PRACTICAL.]

OPTICS, PRACTICAL, is that part of science which applies the physical properties of LIGHT and the mathematical laws of OPTICS to the construction of useful optical instruments. By the former we determine the constants necessary to render the formulæ of the latter convertible into numbers. The refractive and dispersive indices peculiar to transparent media are constants of this nature, and the instruments adapted to the easy vision of near or distant objects, to great or small objects, and to other optical purposes, are, according to the plan of this work, described under their proper heads. [CAMERA LUCIDA; EYE; HELIOSTAT; MICROSCOPE; TELESCOPE; &c.]

The refractive indices of transparent and semi-transparent media have been a subject of research to many experimenters, and were considerably advanced by Newton. (Newton's *Optics*.) The additional properties of light discovered since his time have enabled philosophers to calculate to a far greater degree of accuracy the indices both of refraction and dispersion than was then practicable.

The theory of achromatism, or the method of correcting the aberrations of the rays of light, has been pursued by Euler, D'Alembert, Herschel (Sir J.), and many others; but the earliest successful construction was made by Mr. Hall in 1733. The same was effected in 1757 by Dollond, whose labours, together with that of his son, gave a great impulse towards the complete accomplishment of an object of which Newton seems almost to have despaired. In the same career of late years we must distinguish Frauenhofer, of Benediktbeuern, in Bavaria, who obtained at an early age from the French Academy the prize for the actual construction of achromatic glasses. Not only were the necessary manual operations conducted by himself with patience and the minutest attention to all the practical details of the quality of his glasses and the accuracy of grinding and polishing, but he had also the merit and advantage of observing the dark lines which cross the prismatic spectrum, and which are of the greatest utility in determining the indices above alluded to. From the liability to oxidization of some of the ingredients in the composition, some of his finest telescopes have of late become considerably tarnished, particularly those in exposed situations. This could not have been easily foreseen, and many of his telescopes remain still in good condition.

The first account of his remarkable optical discoveries is given in a paper which he published in the 'Memoirs of the Academy of Bavaria' for 1814-15. By means of a theodolite furnished with a telescope, he measured the distances of the principal lines; and by applying a photometer to the different coloured rays, he has drawn a curve, the ordinates of which express the illuminating powers of the several rays. To these researches he soon afterwards added some beautiful experiments on the diffraction of light, an account of which he published at Munich, and they also appeared in an abridged form in the 'Bibliothèque Universelle,' January, 1822. It is believed that his close application to those and similar researches accelerated his death, which followed soon after.

The accurate determination of the refractive and dispersive indices has also been pursued with great success in this country, and simultaneously by some of the following distinguished men:—Dr. Thomas Young, Dr. Brewster, Dr. Wollaston, Sir J. Herschel, Prof. Faraday, &c.; and in France, by Biot, Dulong, &c., the results of whose experiments, in a very compressed form, are given in the two following tables:—

Refractive Indices.

Hydrogon	1·00014	Glass—English plate	1·500
Oxygen	1·00027	Dutch	1·514
Air (atmospheric)	1·00029	Frauenhofer's crown (No. 13) ray E	1·533
Nitrogen	1·0093	Rock crystal	1·568 to 1·575
Aqueous humour of eye	1·337	Amber	1·547
Vitreous	1·336	Ruby red glass	1·601
Salt-water	1·343	Sulphur	1·958
Albumen	1·360	Glass of antimony	2·000
Crystalline lens of eye	1·378	Diamond (S. G. =3·4)	2·439
Oil of almonds	1·470		
Oil of turpentine	1·475		
Camphor	1·500		

Dispersive Powers.

Chrom. lead	0·400	Oil of turpentine	0·043
Oil of cassia	0·139	Amber	0·041
Green glass	0·061	Gum Arabic	0·036
Flint glass	0·052	Oil of cloves	0·062
		Sulphate of lead	0·060

OPU'NTIA is the name given by botanists to those cactaceous plants which gardeners call *Indian Figs*, and which are so remarkable for their stems consisting of flat joints, broader at the upper than the lower end, but which eventually lose that appearance, becoming both cylindrical and continuous. On one of them, Opuntia cochenillifera, the cochineal insect is fed, and others yield a pleasant subacid fruit, which is eaten in hot countries. The lavas of Ætna are in some places covered with the spiny bushes of Opuntia vulgaris, whose large purple juicy fruits are carried for sale to the neighbouring markets. It is however only a naturalised plant, its native country being South America within the tropics.

ORA (from the Saxon ore, metal), a money of account among the Anglo-Saxons, whatever it might have been in other parts of Europe. In the Domesday Survey, and, as Dr. Hickes assures us, in his 'Dissertatio Epistolaris,' in antient contracts of buying and selling, it is used for the ounce, or a twelfth part of the nummulary pound.

There appear to have been two sorts of ora in use in the Saxon times, one of sixteen pence to the ora, the other of twenty pence. The ora of Domesday Book is perpetually valued at twentypence: as in tom. i., fol. 2 b.: 'Cxi. solid. de denariis xx. in Ora.' Ibid., fol. 11 b.: 'Cxxv. lib. et x. solid. de xx. in Ora.' Tom. i., fol. 164: 'Modo redd. xxiii.

lib. candidorum nummorum de xx. in Ora.' The ora of sixteen pence was of earlier date; but its existence is recognised as late as in the Placita of the 37 Hen. III., Rot. 4. In the Laws of Canute, art. 31, 'De ponderibus,' it is said 'xv. Oræ libram faciunt.' (Clarke, *Connection of the Roman, Saxon, and English Coins*, 4to., Lond., 1771, p. 316; Hickesii *Thesaurus, Diss. Epist.*, pp. 111, 112; Ellis's *General Introduction to Domesd. Book*, vol. i., pp. 165, 166.)

ORACLE (from the Latin *oraculum*, and that from *os, or-is*, a mouth). Oracle was the Roman name used to denote the place where answers were supposed to be given by any of the divinities to those who consulted them respecting the future. Sometimes also it was used to signify the response which was delivered, and sometimes the deity from whom this response was imagined to proceed. Its primary and proper signification indeed is that of a response. Cicero (*Topic.*, 20) says that oracula were so called, 'quod inest in his *Deorum Oratio*.' Those who were sent to consult them were sometimes called *oratores*. (Livy, v. 15.) Oracular responses were called *chresmi* (χρησμοὶ) or *manteia* (μαντεῖα) by the Greeks; the name *manteion* (μαντεῖον) was also often given to the oracular place, or the seat of the oracle.

Curiosity regarding futurity, and the desire to penetrate its mysteries, are dispositions which exert a powerful control over the minds of men in every stage of society; among nations that have made little advancement in civilization and intelligence, they operate with peculiar force; and in these dispositions, combined with the belief that the gods had both the ability and the inclination to afford the knowledge so eagerly longed after, the oracles of the pagan world had their origin. Of these oracles the most famous were those of Greece, and among them that which had claims to the highest antiquity was the oracle of Jupiter at Dodona. According to the account of the priests of Dodona, it was established in the following manner. (Herod., ii. 55.) Two black doves took their flight from Thebes in Egypt. One flew to the temple of Jupiter Ammon in the Libyan desert; the other to Dodona, where, in human language, it proclaimed to the inhabitants of the district that they must establish an oracle (μαντήϊον) of Jupiter there. The account of the priests of Thebes was somewhat different. (Herod., ii. 54.) But the most celebrated of the Grecian oracles was that of Apollo, at Delphi, a city built on the slopes of Parnassus in Phocis. It had been observed at a very early period that the goats feeding on Parnassus were thrown into convulsions when they approached a certain long deep cleft in the side of the mountain. This was the result of a peculiar vapour rising out of the cavern, and one of the goatherds was induced to try its effects upon himself. Inhaling the intoxicating air, he was affected in the same manner as the cattle had been, and the inhabitants of the surrounding country, unable to explain the circumstance, imputed the convulsive ravings to which he gave utterance, while under the power of the noxious exhalations, to a divine inspiration. The fact was speedily circulated widely, and a temple was erected on the spot. The honour of the prophetic influence was at first variously attributed to the goddess Earth, to Neptune, Themis, and others; but it was at length assigned to Apollo, with whom it ever after remained. A priestess was appointed, whose office it was to inhale the hallowed air, and who was named the Pythia. She was prepared for this duty by previous ablution at the fountain of Castalia, and being crowned with laurel, was seated upon a tripod similarly adorned, which was placed over the chasm whence the divine afflatus proceeded. Her inspired words while thus situated were interpreted by the priests. The announcements of the oracle to those by whom it was consulted were originally made in verse; but it having been sarcastically remarked that Apollo, the god of poetry, was himself sadly deficient in the art of which he was the patron, they were subsequently given in prose. It was usual for those who took the advice of the oracle to make rich presents to the god. By this means a vast amount of wealth was amassed at Delphi, as we learn more particularly from the minute descriptions of Herodotus and Pausanias, and the institution rose to great splendor. From the universal veneration in which it was held, it came also to be chosen as a safe depository for much of the riches of the several states of Greece. Its sacred character however did not always prove a sufficient defence against violence and rapacity, and more than once it was plundered of its treasures. [DELPHI.] Besides the oracles of Jupiter and Apollo at Dodona and Delphi, that of Trophonius, near Lebadeia in Bœotia, may be mentioned, as having been held in high estimation. There were many other oracles in Greece, but of less repute.

Among the other most noted oracles of antiquity were that of Jupiter Ammon in the desert of Libya, that of the Branchidæ in Ionia, of Pella in Macedonia, of Sinope in Paphlagonia, of the head of Orpheus at Lesbos, &c. Most of the heathen deities and even the demigods and heroes had oracles of their own. There were also current in Greece numerous so-called prophecies, the productions of individuals who were probably supposed to speak under a divine influence. Such were those of Bacis and Musæus, in which the battle of Salamis was predicted, and that of Lysistratus, an Athenian. (Herod., viii. 96.) But these productions are perhaps more appropriately considered under the head of PROPHECY; though Herodotus applies to them the same name (χρησμὸς) as to the responses from Delphi and other oracular places. As to the Sibylline oracles see SIBYL.

Though the Romans had various modes of ascertaining the will of the deities, it does not appear that oracles like those of Delphi or Dodona were ever established among them; and we find that the oracles of Greece, and particularly the far-famed oracle of Delphi, were consulted by them on many important occasions. (Livy, v. 15; xxii. 57, &c.)

Among the Jews, the Urim and Thummim, which by an extraordinary brightness made known the will of Jehovah, bore a striking resemblance to the heathen oracles; and the oracle of Bathcol, or *daughter of the voice*, which was originated after the death of Malachi, was completely identical with them.

The modes in which oracular responses were delivered were very various. At Dodona they issued from the hollow of an oak, at Delphi they were delivered by the Pythia, and at the oracle of Ammon they were pronounced by the priests. At Memphis a favourable or unfavourable answer was understood to be returned, according as Apis received or rejected what was presented to him. [APIS.] Sometimes the reply was given by letter; and sometimes the required information could be obtained only by casting lots—the lots being dice with certain characters engraved on them, the meaning of which was ascertained by referring to an explanatory table. Dreams, visions, and preternatural voices also announced the will of the divinities.

The importance attached by the Greeks and Romans to oracular responses is a striking feature in the history of those people. Hardly any enterprise, whether public or private, of any moment, was undertaken without recourse being had to them, and their sanction being obtained. In later times indeed their influence was greatly diminished; and thus gradually fell into disrepute. Cicero affirms that long before his age even the Delphic oracle was regarded by many with contempt; and there is little doubt that oracles were considered by philosophers as nothing different from what they really were, and by politicians as instruments which could be used for their purposes. The reply of Cato to Labienus, who wished him, after the battle of Pharsalia, to consult the oracle of Jupiter Ammon, embodies the opinion of that eminent Stoic respecting the propriety of thus questioning the gods. 'On what account, Labienus, would you have me consult Jupiter? Should I ask him whether it be better to lose life than liberty? Whether life be a real good? We have within us, Labienus, an oracle that can answer all these questions. Nothing happens but by the order of God. Let us not require of him to repeat to us what he has sufficiently engraved on our hearts. Truth has not withdrawn into these deserts; it is not engraven on the sands of Libya. . . . Let the inconstant and those that are subject to waver according to events have recourse to oracles. For my part I find in nature everything that can inspire the most constant resolution. The coward, as well as the brave, cannot escape death. Jupiter can tell us no more.' (Lucan, *Pharsalia*, lib. ix., v. 566-584.)

The question has been gravely discussed, whether oracular responses ought to be ascribed to mere human ingenuity and wisdom, or to diabolical agency. Most of the Christian fathers maintained that they ought to be ascribed to the latter. Allusion is made to this opinion in the first book of 'Paradise Lost,' where the spirits of Pandemonium are described as having taken possession of the various idols of

the heathen world. There is nothing however in the history of the antient oracles to countenance such a notion, or to lead to the belief that a supernatural cunning and skill directed them. Their replies to those who consulted them were for the most part obscurely and equivocally expressed, and so as to admit of different explanations, according as the wishes of the inquirer might suggest, or the event determine. And even in those instances where trial was designedly made of the reality of their pretensions, it is not difficult to account for the success with which they stood the test, without calling in the assistance of demoniacal instrumentality.

Another circumstance respecting the oracles, which has given birth to much controversy, is, the time when they ceased altogether to give responses. Eusebius was the first who propounded the opinion that they became silent ever after the birth of Christ, and many writers, willing thus to do honour to the author of Christianity, have given it their support. Milton makes allusion to this theory also in the most magnificent of all his minor poems, 'The Hymn of the Nativity;' and in lines of solemn and elevated beauty, of which the following are the commencement, pictures the consternation of the heathen idols at the advent of the Saviour:—

> 'The oracles are dumb,
> No voice or hideous hum
> Rings through the arched roof in words deceiving.
> Apollo from his shrine
> Can no more divine,
> With hollow shriek the steep of Delphos leaving.
> No nightly trance or breathed spell
> Inspires the pale-eyed priest from the prophetic cell.'

But the circumstance that may thus be made available for the purposes of poetical ornament, happens unfortunately to be contrary to fact. It appears from the edicts of the emperors Theodosius, Gratian, and Valentinian, that oracles existed and were occasionally at least consulted till so late as A.D. 358. About that period they entirely ceased, though for several centuries previous they had sunk very low in public esteem. So few resorted to them, that it was no longer a matter of interest to maintain them. Towards this consummation Christianity powerfully contributed, by the superior enlightenment which it carried along with it wherever it was introduced, and by the display which it made of the falsehood and folly of the superstitions which it was destined to overthrow. The following works treat of oracles:—Cicero, *De Divinatione et Fato;* Clusens (Daniel), *De Oraculis Gentilium*, 1673; Dale (Anton. Van), *De Oraculis Ethnicorum*, 1683; *An attempt to prove that the Greeks borrowed the Story of their Oracles from the Holy Scriptures*, by E. Dickinson, 1686; Fontenelle (Bernard le Bovier), *Histoire des Oracles*, 1687; Bulenger (Julius Cæsar), *De Oraculis et Vatibus*, 1699; Dr. Bengo Collier's *Christianity compared with Hinduism, Mohammedanism, the Antient Philosophy, &c.;* Clavier, *Mémoire sur les Oracles des Anciens*, 1819.

ORAN. [ALGIERS.]

ORAN-ELF. [BOTHNIA.]

ORANGE. In the article CITRUS the different species of this genus have been described, as well as the more remarkable varieties of the orange. It is there stated that India and China are probably the native countries of the orange tribe; and also that from the observations of Dr. Wallich and other Indian botanists, the orange, the lemon, lime, and citron were all that could be distinguished as distinct species. Since then Dr. Royle has stated (*Illust. Him. Bot.*, p. 130), that he has found two plants, having the characters of the *lemon* and *citron*, growing wild in the jungly valleys at the foot of the Himalayas, in the tract between the Ganges and Jumna rivers, which, when transferred to gardens, retained their characters. He further states that from the Rungpore forests a round kind of *lime* is obtained; while in those of Silhet, as well as on the sides of the Neelgherries, the *orange* is described as being found wild.

Captain Turner, in the account of his journey to Teshoo Loomboo, mentions the orange as delicious; and Mr. Saunders, who accompanied him, describes many orange and lime trees as found at the foot of the hills in approaching Buxedwar. The various kinds of sweet lime and lemon are also common in India; though the shaddock is probably of foreign origin, as it is usually called Batavi nimbo, or Batavian lemon. Hence there can be no doubt of the orange, lemon, lime, and citron being natives of India, though it is probable that some of the species are also indigenous in China, as is the case with many genera and even species which are common to the Himalayan mountains and to the flora of China. That it was introduced into Europe from India, either directly or through the medium of the Arabs or Persians, is probable from the similarity of the names; the orange being in Sanscrit *nagrungan*, Hindu *narungee*, Arabic *narunj*, Spanish *naranja*, Italian *arunceo*, while the lemon is in Sanscrit *neembooka*, Bengalee *neeboo*, Hindu *neemoo* and *leemoo*, Arabic *limon*, whence the European *limon* and *lemon*. But nothing in the history of vegetables is more difficult to determine than the native country of cultivated plants. There was always much communication between India and the Red Sea, and the Arabs also introduced many Indian plants into their dominions. The lemon and orange are common in Abyssinia. Bruce says the lemon is indigenous; and Alvarez speaks of lemons and oranges in parts which Bruce did not visit. (See the *Travels* of Alvarez.)

The orange has been adduced (*Spectator*, No. 155) as a rare instance of a plant vigorous enough to have at once beautiful shining leaves, fragrant flowers, and delicious nourishing fruit. But it is still more remarkable as a fruit of very warm southern countries which has been transferred to Europe and succeeds well in the open air in some parts of Italy. This is probably owing to its being a shrub which does not ripen its fruit even in India until the cold weather or winter of that country. It is thus naturally disposed to bear a greater degree of cold, and thus has been able to travel from India and China 'to the southern shores of Europe, and find a congenial climate in the equable and temperate climate of the Azores.' It is often made a subject of discussion whether the orange, lemon, and citron were known to the antients. There does not appear to be any evidence of sufficient weight in favour of the two former, but it is extremely probable that the citron was the Assyrian, Median, or Persian apple of the antients. Dr. Royle has remarked it as worthy of notice that the Persian and Arabian authors, when describing them, do not give any Greek synonymes of either the orange or lemon. But of the citron they state *marseeska* to be the Greek and *atrogha* the Syrian name, the former of which has not yet been traced out, but the latter appears of the same origin as the Arabic *ooteruj*. The Sanscrit name of the citron is *Beeja poora*, and the Persian *toorunj*; by the latter name it is also known in the north-western provinces of India.

The orange-tree, being a native of warm southern latitudes, is a remarkable instance of one which gives employment to and forms even an article of commerce from the southern to the more northern European nations. Thus, it is exported from Italy and Malta, as well as from the south of Spain and from Portugal, but in very large quantities from the Azores. Its cultivation is profitable not only on account of the esteem in which the fruit is held, but also from the extreme prolificness of the tree, so that the fruit is sold even in England at a price not much above and sometimes even for less than our own apples and pears.

Oranges are imported, as well as lemons, packed in boxes, and wrapped up separately in paper. The entries for home consumption, in 1831 and 1832, as calculated by Mr. M'Culloch, amounted on an average to 270,606 boxes a year, and assuming each box to contain 700 oranges and lemons, the numbers amounted to 189,424,000, and the duty, on an average of the above years, to 61,036*l*. a year.

The citron is considered to have been first cultivated in Italy by Palladius, in the second century, but the orange not until the fourteenth century; it is probable, from the name, that it was first introduced by the Arabs into Spain, 'where fruits of fragrance blush on every tree,' and where are seen 'the orange tints that gild the greenest bough.' They can bear the open air also at Nice, Genoa, and Naples, but at Florence and Milan, and often at Rome, they require the temporary protection of a shed. They are usually planted in boxes, and removed from the conservatory into the open air in summer, in France as well as in England; but since the introduction of the great variety of flowers from all countries, orangeries and fine specimens of orange and citron trees have been less in fashion, though none are more desirable on account of the combination of elegant verdure, the grateful odour of the flowers, and the rich appearance of the fruit. They have been cultivated in England since 1492; and Mr. Loudon states that at the Wilderness, Kent, there are three trees in boxes, not sur-

passed by any trees so grown in Europe; and that at Saltcombe in Devonshire there are in a few gardens orange-trees which have withstood the winter in the open air for upwards of a hundred years. They are propagated either by seeds, by cuttings, by layers, by grafting, or inoculation. The plants grown from seeds require so long to come to perfection, that they are seldom so propagated in England. The most regular and garden-like culture is in the orange orchards at Nervi, Monaco, and other places in the neighbourhood of Genoa. At the former are the orange nurseries which may be said to supply all Europe with trees, though the cultivation is of a very indifferent character, but the fine climate, strong clayey soil, and abundant manurings supply the place of more skilful treatment. Budding and grafting are performed in England at the usual season for such operations, but they may be performed at any time when the sap is in motion. Mr. Henderson, of Woodhall, one of the most successful growers of the Citrus tribe, has given a full description of the practices he adopts (*Caled. Hort. Mem.*, iii. 308; and Loudon's *Encycl. of Gardening*), and considers cuttings as the quickest mode of getting plants. At Genoa and Florence the trees are grown in a strong yellow clay which is richly manured. The French, in preparing a compost, compensate for quantity by richness of manure. Henderson takes one part of light brown mould from a piece of ground that has not been cropped or manured for many years, one part of peat earth such as is used for growing heath, two parts of river-sand, or pit-sand, if it be free from mineral substances, and one part of rotted hot-bed dung, with one part of rotted leaves of trees, and mixes them all well together, so as to form a compact soil of uniform quality.

Though orange-trees grow exceedingly well in pots and boxes, yet to have them produce the finest crop of fruit, they should be planted in the ground like peach-trees, or as standard cherry-trees in a conservatory, but the largest fruit is produced when the trees are planted against the back wall trellis of a narrow house.

(See the work of Risso of Nice and Poiteaux of Versailles, *Histoire Naturelle des Oranges*, where 169 sorts are described, and 105 of them figured; also that of Gallezio, *Traité du genus Citrus*, who has given an account of the 40 different kinds cultivated in Italy; and Mr. Loudon's *Encycl. of Gardening*.)

ORANGE, a town in France, capital of an arrondissement, in the department of Vaucluse, on the road from Paris to Avignon, Aix, and Marseille, 414 miles from Paris through Auxerre and Lyon, in 44° 8′ or 44° 9′ N. lat. and 4° 48′ E. long.

This town existed in the Celtic and Roman periods, and was called Arausio. It is mentioned by Strabo as one of the towns of the Cavares: Mela and Pliny call it Arausio Secundanorum, and the latter describes it as a Roman colony. The epithet Secundanorum has been derived from the designation of the soldiers who were quartered or settled as colonists. Orange contains more Roman antiquities than most other towns in France, and may vie with the cities of Italy. A triumphal arch, called by the inhabitants of the district the arch of Marius, but which is probably of the age of Augustus, stands in the middle of a field on the north side of the town, near the road from Paris and Lyon: it is about 60 feet high, and has three archways, of which the middle one, intended for carriages, is larger than the other two. The vault of the centre arch is richly sculptured. Between the arches are fluted columns of the Corinthian order, most of them much decayed through age, and others are entirely destroyed. The attics are adorned with reliefs, much decayed, but of great archæological interest: on one of these the name Mario, among others, inscribed on a trophy, has given rise to the general opinion as to the person to whom the arch was erected. The sides of this triumphal arch are decorated with columns and reliefs. Another remarkable antiquity, a ruined wall, the back of the scene or stage of a theatre, is in the centre of the town: it is composed of large stones, joined without cement, and is altogether a magnificent piece of masonry. The amphitheatre, of which the traces were visible till of late years, has gradually disappeared, the stones having been carried away to be used in the erection of new houses. Of an aqueduct which brought water to the town there are no remains, except at Vaison, which is several miles distant. There are various fragments of antiquity in private houses

The Visigoths and Burgundians got possession of the town on the downfal of the Roman empire, and from them it passed to the Franks. In the middle ages it was the capital of a principality, which, after passing through different families, came to that of Nassau. On the death of William III. of England, who held it, it was claimed by the king of Prussia as his heir; and the king of Prussia ceded it to the king of France in exchange for the town and territory of Guelder. It was annexed to Dauphiné until the establishment of the division into departments. The title Prince of Orange is retained by the royal family of Holland. [NASSAU, HOUSE OF.]

The town of Orange is in a delightful country, and presents a pleasing appearance: it is however really ill built, with narrow, crooked, and ill-paved streets. There are several squares, and some tolerably handsome fountains. There are several parish churches, one of which was formerly a cathedral, for Orange was the seat of a bishopric before the Revolution; and a Protestant place of worship, remarkable for the boldness of its architecture. The population, in 1831, was 6211 for the town, or 9123 for the whole commune; in 1836, 8874 for the commune. The inhabitants manufacture printed calicos, handkerchiefs, and thrown silk; and trade in corn of all kinds, fruits, wine, brandy, honey, oil, wool, silk, saffron, madder, and truffles. There are five yearly fairs. The cultivation of the olive commences in the neighbourhood of Orange. There are in the town several government offices, a high-school, a society of agriculture, science, and arts, and an hospital.

The arrondissement of Orange comprehends an area of 377 square miles, and includes 48 communes. It is divided into seven cantons, or districts, each under a justice of the peace. The population, in 1831, was 66,653; in 1836 it was 67,443. (*Communication from Orange*, &c.)

ORANGE, River. [CAPE OF GOOD HOPE.]

ORANG-UTAN, or ORANG OUTANG, names by which the *Pithecus Satyrus* of Geoffroy (*Simia Satyrus*, Linn.), *the Red Orang*, is now generally designated. In the articles APE and CHIMPANZEE much will be found relating to this curious form and its approximations. But the animal is so interesting, that nothing but want of space, which readers not zoological might think unjustifiably occupied, prevents us from entering at large into the subject and giving a correct figure from the life; for, with few exceptions, artists are in the habit of depicting this animal, as well as the *Chimpanzee*, sometimes with and sometimes without support, in an erect position—an unnatural attitude, against which its whole form and structure militate. We must here however confine ourselves to a mere description of the species, with figures of the skeletons of the young and adult, from Professor Owen: these skeletons will, at once, strike the observer with their admirable adaptation for quadrumane or cheiroped machinery and arboreal habits, and their inaptitude for erect progression.

Subgenus Pithecus.

Muzzle large, elongated, somewhat rounded anteriorly; forehead sloping backwards; slight supraciliary ridges, but strong sagittal and lambdoidal crests. *Facial angle* 30°. *Auricles* small. Twelve pairs of *ribs*; bones of the *sternum* in a double alternate row. *Arms* reaching to the ankle-joint. No *ligamentum teres* in the hip joint. *Feet* long and narrow; *hallux* not extending to the end of the metacarpal bone of the adjoining toe; often wanting the ungueal phalanx and nail. *Canines* very large, their apices extending beyond the intervals of the opposite teeth. *Intermaxillary bones* anchylosed to the maxillaries during the second or permanent dentition. *Height* under five feet.

Habitat.—The islands of Borneo and Sumatra. (Owen.)

Professor Owen remarks that the young individual exhibits the anthropoid character in the relative smallness of the face to the cranium, resulting from the state of dentition, but that it corresponds with the adult skeleton in the number of ribs and in the relative proportions of the upper and lower extremities. With regard to the number of vertebræ, he observes that the figure of the adult skeleton, which was taken by permission of the board of curators from the specimen in the museum of the Royal College of Surgeons, exhibits the abnormal number of five lumbar vertebræ instead of four, which is the number existing in the trunk of the mature *Orang* preserved in the museum of the Zoological Society of London, and in the skeleton in the museum of comparative anatomy in the Jardin des Plantes.

The student will do well to study carefully the whole of the Professor's valuable remarks and beautifully accurate illustrations relating to the *Orangs*, or great tailless *Apes* of Asia and Africa, in the *Transactions of the Zoological Society of London*. The form of the living animal and its habits in captivity will have been familiar to most of our London readers from their opportunities of observing the deportment of *Jenny*, the *Red Orang*, which died this year (1839) in the gardens of that Society in the Regent's Park.



Side view of the skeletons of Pithecus Satyrus, young and adult (from Owen).

ORATO'RIO (Ital.), a sacred musical composition, consisting of airs, duets, &c., and choruses. The text is generally a dramatic poem, as Handel's *Samson* and Cimarosa's *Sacrifizio d'Abramo*. Sometimes it takes the form of a narrative, as *Israel in Egypt;* and occasionally it is of a mixed kind, as Haydn's *Creation*. *The Messiah* is a collection of passages from our received translation of the Scriptures.

Concerning the origin of the Oratorio, Dr. Brown, Sir John Hawkins, and others seem to have misunderstood the *Père* Menestrier, who, in his work *Des Représentations en Musique*, attributes to the pilgrims, on their return from the Holy Land, not the introduction of what we term oratorios, as those writers suppose, but of the sacred dramas called *Mysteries*. And the learned Jesuit is perhaps himself in error on this subject. It is Warton's opinion that about the eighth century the merchants who frequented the fairs, employing every art to draw numbers together, were accompanied by jugglers, minstrels, and buffoons, who were the source of great amusement to the people. The clergy, thinking that such entertainments tended to irreligion, proscribed them; but their censures and fulminations being disregarded, they took into their own hands the management of popular recreations—they turned actors—and, instead of profane mummeries, presented stories taken from legends or from the Bible. (*History of Poetry.*) Voltaire conjectures that religious dramas came from Constantinople, where, about the fourth century, Gregory of Nazianzus, an archbishop, and one of the fathers of the church, banished plays from the stage of that city, and introduced stories from the Old and New Testament. As the antient Greek Tragedy was originally a religious representation, a transition was made on the same plan, and the choruses turned into Christian hymns. 'This opinion,' says the candid Warton, 'will acquire probability, if we consider the early commercial intercourse between Italy and Constantinople.' Admitting this, we need seek no further for the original source of the sacred musical drama.

As regards the more recent introduction of the Oratorio, Crescimbeni, in his *Comentarj*, tells us that it is attributable to San Filippo Neri, born in 1515, who, in his chapel,—('*nel suo oratorio*')—after sermons and other devotions, in order to allure young people to pious offices, and to detain them from earthly pleasure, had hymns and psalms sung by one or more voices. [NERI.] Bourdelot is rather more circumstantial on this subject. He says, S. Philippe de Nery, a native of Florence, founder, in 1540, of the congregation of the Priests of the Oratory in Italy, observing the taste and passion of the Romans for musical entertainments, determined to afford the nobles and people the means of enjoying them on Sundays and festivals in his church, and engaged for this purpose the ablest poets and composers, who produced dialogues in verse on the principal subjects of Scripture, which he caused to be performed by the most beautiful voices in Rome, accompanied by all sorts of instruments. These performances consisted of airs, duets, trios, and recitatives for four voices: the subjects were, Job and his Friends; the Prodigal Son received by his father; the Angel Gabriel with the Virgin; and the Mystery of the Incarnation. Nothing was spared to render these attractive, the novelty and perfection whereof drew a crowd of auditors, who were delighted with the performances, and contributed largely, by admission money, to the expenses incurred. Hence are derived what we now call Oratorios, or sacred representations. (*Histoire de la Musique*, 1743, i. 256.) Some of these poems were printed, under the title of *Laudi Spirituali*, and among the first authors of them was P. Agostino Manni. One of the most remarkable was entitled *Rappresentatione di Anima e di Corpo, del Signor Emilio del Cavalieri, per recitar cantando*. It was the first attempt in the recitative style, and performed in action, on a stage erected in the church of *Santa Maria della Vallicella* at Rome, with scenes, dances, &c., as appears from the editor's dedication to Cardinal Aldobrandini, and the composer's instructions for the performance. From the latter Dr. Burney (*Hist.*, iv. 88) gives some curious extracts, among which are the following:—

The accompanying instruments—namely, a double lyre, a harpsichord, a large guitar, and two flutes—to be behind the scenes; but the performers are desired to have instruments in their hands, as the appearing to play would help the illusion.

The books of the words were printed. Instead of the modern overture, a madrigal, with all the parts doubled, and fully accompanied, is recommended.

When the curtain rises, two youths, who recite the prologue, appear. Then *Time*, one of the characters, comes on, and has the note with which he is to begin given him by the instruments behind the scenes. The *chorus* is to be placed on the stage, part sitting and part standing; and when they sing they are to be in motion, with gestures.

Il Corpo (the body), at the words *Si che hormai alma via*, throws away his ornaments. The *World* and *Human Life* are to be gaily dressed; and when divested of their trappings, are to appear poor and wretched; and finally dead carcasses.

The performance may conclude with or without a dance. If without, the last chorus is to be doubled in all its parts. But if a dance is preferred, a verse beginning '*Chiostri altissimi*' is to be sung, accompanied reverentially by the dance. During the ritornels the four principal dancers are to perform a ballet, *saltato con capriole* (danced with *capers*), without singing. They may sometimes use the *galliard* step, sometimes the *canary*, and sometimes the *courant*.

The name of *Oratorios* was given, some think, to these performances, because they owed their birth to the *priests of the Oratory;* we are however more inclined to derive the term from the place, the *oratorio* (*oratorium*, oratory, or small chapel), in which they were first heard. But the word does not appear to have been in use till about the year 1630, when Balducci applied it to two of his sacred poems.

The unfortunate Stradella was one of the first of those who distinguished themselves in this exalted kind of composition [STRADELLA]; his '*Oratorio di S. Gio. Battista*,' produced about the year 1670, is analysed and much praised by Burney (iv. 105). A fine chorus from this, in five parts, is printed in the 4th vol. of *The Fitzwilliam Music*. The increasing popularity of the sacred drama at length induced

poets of eminence to employ their pens in its service. Apostolo Zeno, the Imperial poet-laureate, produced seventeen works of this kind, under the title of *Azioni Sacre*, most of which were set by Caldara, Imperial vice-chapel-master to Leopold I., whose reputation as a composer of sacred music deservedly stands high. The first of them, *Sisara*, was performed in 1717. Metastasio wrote seven *Azioni*, of which Caldara set two; the first, *La Passione*, in 1730. This was re-set by Jomelli, and is justly reckoned among the best of his works.

The Oratorio was introduced into England in 1720, when Handel set *Esther*—Racine's tragedy abridged and altered by Mr. Humphreys—for the chapel of the duke of Chandos (Pope's *Timon*) at Cannons. This, in 1731, was performed by the Children of the Chapel-Royal, at the house of their master, Bernard Gates. The next year it was publicly produced, as appears from the following advertisement in the *Daily Journal*:—'By His Majesty's command, at the King's Theatre in the Haymarket, on Tuesday, the 2nd of May, will be performed the sacred story of *Esther*, an oratorio in English, formerly composed by Mr. Handel, and now revived by him, with several additions, and to be performed by a great number of voices and instruments. N.B. There will be no acting on the stage, but the house will be fitted up in a decent manner for the audience.' The success of this was of the most decided and encouraging kind: but for an account of the great master's other oratorios, and of his inducement for first producing them, we refer to a former volume. [HANDEL.] The custom of performing oratorios on the Wednesdays and Fridays in Lent is to be dated from 1737, from which time they were, with few intermissions, continued till a very recent period. Handel was succeeded in this musical speculation by his friend J. C. Smith, who was followed by Stanley and the elder Linley. [STANLEY; LINLEY.] Linley and Dr. Arnold then in conjunction most successfully carried on the oratorios, which were continued by the latter, on the retirement of his colleague. [ARNOLD.] An opposition was now started by Ashley, who had been active as a subordinate agent at the Commemoration of Handel in 1784. This person soon transformed the performances into secular and often vulgar concerts, though retaining the original name; and from that time the oratorios began to degenerate; till at length, having been for some years carried on by different persons, and generally at a loss, they ceased altogether. Though it would be unjust not to admit that, even during this unfavourable interval, there were two or three seasons that reflected some credit on the managers, in which *The Messiah*, with Mozart's added accompaniments, was first publicly produced in London, and also Beethoven's *Mount of Olives*.

ORATORY. The principal design of oratory is to convince or persuade. It contemplates the investigation of truth only as a secondary object. Assuming as its basis certain supposed or admitted principles or facts, its aim is, by presenting these in the form best adapted to win the assent of the understanding and impress the heart, to deter from or incline to a particular mode of resolution and action. This, the chief end of oratory, ought never to be left out of sight in any disquisition on that subject, inasmuch as upon it the general theory of the art is founded.

At a very early period, as appears from the 'Iliad,' the oratorical art was held in high estimation among the Greeks. According to Quintilian however nearly the first person by whom it was properly cultivated was Empedocles, the date of whose birth is unknown; but his flourishing period was about 450 B.C. Corax and Tisias, the earliest writers on the art, were both natives of Sicily. (Quintil., *Instit. Orat.*, iii., c. 1.) Contemporary with them was Gorgias, also a native of Sicily, who was so distinguished for his eloquence that a golden statue was erected to him at Delphi. He, together with Protagoras of Abdera, Prodicus of Ceos, and Thrasymachus of Calchedon, are mentioned as the first who treated of common-places (*communes loci*). The most celebrated disciple of Gorgias was Isocrates, whom Cicero describes as the greatest master and teacher of the art. The treatise of Aristotle on Rhetoric is the oldest extant treatise on the rhetorical art, and one of the most valuable books which has been preserved from antient times. Demosthenes, who probably enjoyed the instruction both of Isocrates and of Isæus, by incessant application overcame the obstacles which nature had placed in the way of his becoming an orator, and attained a degree of excellence in his art which has immortalised his name. His opponent and rival, Æschines, after his banishment, is said to have taught rhetoric at Rhodes. We have no treatise on the art by either of these great masters, but we possess, in their extant orations, models which are more valuable than any treatise could have been. Theodectes and Theophrastus, scholars of Aristotle, were both authors of rhetorical treatises (Fabric., *Bibl. Gr.*, v. 2, p. 241); and after them the philosophers, particularly those of the Stoic and Peripatetic sects, bestowed much attention upon the rules of oratory. A valuable extant treatise upon composition (περὶ Ἑρμηνείας) is ascribed to Demetrius Phalereus; and Dionysius of Halicarnassus is the author of a treatise of Rhetoric, and of critical remarks on the Greek orators, which deserve a careful perusal. Besides those that have been named, other Greek orators of later times are spoken of by Quintilian, among whom are Hermagoras, Athenæus, Apollonius Molon of Rhodes, who was one of Cicero's masters, Arius Cæcilius, Apollonius of Pergamus, and Theodorus of Gadara. After Quintilian, the writers of chief note are Hermogenes and Longinus.

The art of oratory was in a state of maturity in Greece, before it even began to be studied at Rome. So late as B.C. 161, the senate passed a decree expelling the philosophers and rhetoricians from the city. (Gell., xv. 1.) Six years after however, Carneades, Critolaus, and Diogenes, having come as ambassadors from Athens to Rome, the Roman youth were so attracted by their eloquence that they determined to commence the study of the art. It is stated by Seneca that Lucius Plotinus, a Gaul, was the first who taught oratory at Rome. This profession was for awhile confined to freedmen, but it was at length adopted by Blandus of the equestrian order. He was succeeded by others, of whom some particulars have been recorded by Suetonius. The following names of Roman rhetorical writers are given by Quintilian: Marcus Cato the censor, Antony the orator, Cornificius, Stertinius, and Gallio; and in Quintilian's own age, Virginius, Pliny, and Rutilius. Cicero, whose name we have intentionally omitted in the above list, as he was the most illustrious of the Roman orators, was also one of the most copious and elegant of the antient writers on oratory. His treatises on this subject, which are numerous, are respectively entitled: 'Of Invention;' 'Of Topics;' 'Of the Divisions of Oratory;' 'The Orator, or Brutus;' 'Of Famous Orators;' and 'Of the Orator.' The last-mentioned work is comprehended in three books, and is in the form of a dialogue. The chief speakers are L. Crassus and M. Antonius; and into the mouth of the former Cicero puts his own opinions. The first book is general, relating to the difficulties of the art of oratory, and the branches of study with which the accomplished orator ought to be conversant. According to Crassus the qualifications of the orator must be of the highest order. The object of his art is to give to speaking the greatest power of which it is susceptible, and he ought to make himself familiar with all departments of learning. Eloquence does not consist in the observance of artificial rules; such rules are rather deduced from an examination of the qualities of eloquence. The practice of reading, of delivery, and the improvement of the memory, should be diligently attended to by the orator, and above all, he must possess an intimate acquaintance with matters of law. These and other similar positions are controverted by Antonius, who maintains that an extensive and minute knowledge of law is not indispensable, and that he is an orator who can speak on civil and common affairs readily and persuasively.

The second book treats of invention, of disposition, and memory. The first is considered in a threefold point of view, according as it is the design of the speaker to instruct, to persuade, or to delight. Under disposition the various parts of an oration are discussed, viz. the exordium, narration, division, confirmation, refutation, and conclusion. The three kinds of orations, the deliberative, the judicial, and the demonstrative, are also considered, and the book concludes with observations concerning an artificial memory.

In the third book the subject of elocution is taken up: the characters of words, the structure and embellishments of sentences, and other circumstances connected with language and style, are commented on at considerable length. A discussion on action terminates the whole work.

Quintilian, who was himself a rhetorician of high reputation, wrote after Cicero. He had consequently the advantage of the writings of the latter, and his 'Institutions o.

Oratory,' in twelve books, are generally regarded as the most complete work on the subject. Certain orations or declamations ascribed to him are still in existence; but as they little accord with his own rules, their genuineness is not universally admitted. [QUINTILIAN.]

It may be observed that the reign of eloquence in Greece was of much longer duration than in Rome. Among the Greeks it took its rise with republican institutions, and continued to flourish down to the time of Alexander the Great, a period of 150 years; in the latter, it began and ended with the age of Cicero. The difference has been ascribed to the more free and popular forms of government that obtained in many Grecian states, and this idea seems to receive countenance from the fact that eloquence and the liberties of Greece were coeval: the one ceased when the other was destroyed. The age of rhetoricians succeeded among the Greeks to that of the orators; and though oratory such as that of Demosthenes and Æschines was no longer permitted by circumstances, yet the teachers of rhetoric among the Greeks cultivated the art as a discipline and also employed it as a kind of theatrical exhibition. Among this class of orators we may enumerate Aristides and others. [ARISTIDES.]

It was the Archbishop of Cambray's opinion that the proper method of forming a system of oratory is to collect it from the best precepts of Aristotle, Cicero, Quintilian, and Longinus. The opinion has been repeated and acted upon by Ward, in one of the few systems which this country has produced.

The elements of oratory are usually comprehended under the four following divisions: *invention, disposition, expression* or *language*, and *delivery*. The first has respect to the character of the thoughts, the second to the manner of their arrangement, and the third and fourth to words, sentences, style, utterance, &c.

Besides the common observations that may be made on any subject, there are peculiar ideas appropriate to the exposition and illustration of each peculiar subject, and among these some which are more appropriate for this purpose than others. These it is the business of the orator to discover, and the discovery of them is termed *invention*.

Where argument is requisite, those arguments which are most powerful ought to be adduced; where objections are apprehended, they must be refuted; and where declamation is resorted to, the incentives best adapted to excite the passions and engage them in behalf of the cause which the speaker advocates must be brought forward. The Greek rhetoricians specified under invention a great variety of particulars intended to assist the orator, whatever might be the matter on which he was required to employ his eloquence: these they called *topics* (τοπικά, the *loci* of Cicero, *Topic.*, c. 2), and divided them into internal topics, or commonplaces, and external topics, or testimonies. Internal topics are such as arise out of the subject itself. As given by Cicero and Quintilian, they amount to sixteen in number. These are—definition, enumeration, notation, genus, species, antecedents, consequents, adjuncts, conjugates, cause, effect, contraries, opposites, similitude, dissimilitude, comparison. The first three comprehend the whole thing to which they have reference: definition explains the nature of a thing; enumeration takes in all its parts; and notation gives the signification of words. Of the remaining thirteen, some contain part of the thing spoken of, and the others its various properties, circumstances, &c. Genus comprehends several species of things of different kinds. Species, all individuals of the same kind. Antecedents are such things as, being admitted, imply the necessary or probable existence of others. Adjuncts are adventitious qualities of things and circumstances not necessarily connected with them. Conjugates are words having the same origin with one another, as *wise, wisely, wisdom*. A cause is that by which anything exists; and an effect, that which proceeds from a cause. Contraries are things which, included in one genus, are the farthest removed from each other, so that what is affirmed of the one is denied of the other. Opposites are things which, though repugnant, are not directly contrary. Similitude and dissimilitude are the agreement or disagreement of things in quality. Comparison traces contrarieties or resemblances in other particulars, as when a thing is compared with its greater, or its equal or its less.

External topics, or testimonies, are such as do not arise from the subject itself, but are furnished from without: they are either divine or human. The first, where clearly ascertained, are sufficient of themselves to determine any question; the last are reduced to three, writings, witnesses, and contracts.

The antient rhetoricians paid great attention to what were termed the states of a controversy, or the principal points in dispute. These are all comprehended by Cicero in the inquiries, whether a thing is, what it is, and how it is.

In addition to the general sources of argument furnished by the topics, others more particular were specified, suited respectively to demonstrative, deliberative, and judicial discourses.

When the materials of which an oration is to consist have been procured, it next remains to arrange them in a proper form. The thoughts may be excellent in themselves and in relation to their object, yet if they be produced in a confused and disorderly shape, their application perhaps will not be readily apparent, and certainly they will be deprived of much of their force. Hence the second element of oratory, *disposition*, which concerns the right distribution of the ideas. It is necessary that they should succeed each other, if not by a natural connection, at least by an easy sequence, and that the orator should proceed from what is of less to what is of greater importance. Everything inconsequential ought to be avoided, and care must be taken lest the introduction of what is of little moment to the attainment of the purpose in view should obliterate or obscure the recollection of graver and more important considerations previously advanced.

Rhetoricians differ in their statement of the several parts of which an oration consists. In Cicero's work concerning the orator they are mentioned as five—the exordium, narration, division, confirmation, refutation, and conclusion: to these may be added, if necessary, digression, transition, amplification. It is not of consequence however that these divisions should in every case be minutely observed. The orator may on certain occasions, to be determined by his own judgment, break forth without prefatory remark in the middle of his subject. Cicero's often cited oration against Catiline may be mentioned as an instance of this, in which he commences at once with an energy and vehemence that would, under other circumstances, have been reserved for a more advanced stage of his harangue.

Another object to be attended to by the orator is the language and style of his oration. This falls under the head of *expression*. This department of oratory comprehends elegance, composition, dignity.

Elegance consists in perspicuity and purity. Low, obsolete, and foreign terms are to be avoided, as having a disagreeable effect upon the hearer, and being in so far opposed to the object for which oratory is employed. Clearness, on the contrary, must be constantly aimed at, inasmuch as without it the speaker will only be partially understood, and consequently cannot hope to produce the full effect to which he may aspire

Composition supplies rules for the formation of sentences with the various members, words, and syllables of which they are made up. It is divided into period, order, juncture, and number. The first treats of the structure of sentences; the second, of parts of sentences, namely, words and members; and the last two, of parts of words, or syllables and letters.

Dignity consists in the proper use of tropes and figures.

Style is distinguished into the plain or familiar, the middle or elegant, and the sublime. The characteristics of each are sufficiently indicated in the terms by which they are designated. All of them may with propriety find a place in the same oration; none of them can perhaps be long employed effectually without being relieved by an interchange with the others. The familiar, however entertaining for awhile, is apt to appear vapid at last; the elegant becomes insipid; and the sublime calls for an effort on the part of the listener that can only be sustained for a short time. In lengthened harangues therefore variety is requisite, if the attention and interest of the hearers are to be secured. In the choice of his style the orator must be chiefly determined by the nature of the subject and the character of the audience. On a common and familiar subject, to use lofty and figurative language would be ridiculous, as to use mean and insignificant expressions on a subject in itself noble and elevated would be offensive. In like manner, to address in the same strain a plain and unlettered audience, and a learned and dignified assembly, would be impertinent and absurd.

Delivery includes everything connected with the utterance of speech, the modulation of the voice, gesture, &c.

The division of oratory by the antient rhetoricians into the demonstrative or laudatory, the deliberative, and the judicial, has been adverted to. The classification is judicious, and comprehends the several kinds of public speaking still in use. These may be conveniently arranged in the following order: the oratory of the Senate, of the Bar, of the Pulpit, and of the Mob. The oratory of the Stage occupies a place by itself: it is not contemplated in any of the remarks that have yet been made, and requires separate consideration.

The oratory of the senate, or popular oratory, as it is sometimes termed, has respect generally to the welfare and honour of states, which involve an immense number of topics differing in nature and importance. Accordingly this branch of oratory admits of a corresponding variety of style and character. It may be deliberative, or controversial, or declamatory, according to the subject about which it is occupied, or the end to be accomplished. There is perhaps no department of rhetorical excellence which it does not include, and nowhere therefore will the orator find a wider field for the exercise of his powers. It is supposed that in this case he addresses a well-instructed audience; and this circumstance must be allowed to have its due influence in the construction of his oration. He ought, it has been said, to unite the dignity of the statesman with the propriety of the scholar. It may be questioned whether, in this country at least, Demosthenes's thrice-inculcated quality of action is deemed a very essential element of good oratory. It is for the most part but sparingly resorted to, and its employment to the extent that would seem to be implied in the earnestness with which it was enjoined by the Grecian orator, would be considered a better qualification for the orator of the mob than the orator of the senate.

The oratory of the bar is the same as the judicial oratory of the antients. It supposes two parties, plaintiff and defendant. The matters about which it is conversant are the rights of property and the lives and characters of individuals. The object of the orator is to secure success to the party whose interests he advocates, by proving, to the satisfaction of those by whom the cause is to be decided, the justice of his claims or the innocence of his conduct. His oration therefore must be in a great measure strictly argumentative, and constructed with the design of producing conviction. The nature of such an oration may be illustrated by reference to the arguments laid down by the antient rhetoricians as appropriate to judicial discourses in criminal cases. First, there occurs the conjectural state of the question, in which it is inquired whether the party accused would, could, or did do what is laid to his charge; and next the definitive, where the proper name to be assigned to the fact is discussed; further, admitting the truth of the accusation, the criminality of the action may be disputed; and lastly, even granting this, the accused may be defended, and the offence palliated, by pleading the absence of wilful design or bad intention. The province of the oratory of the bar is manifestly more circumscribed than that of the senate. The forensic eloquence of the Greeks and Romans, and particularly the former, differed considerably from what such eloquence must now be, and bore a closer resemblance to the senatorial. Among the Athenians at least the orator was not so much fettered by the provisions of a complex and intricate system of law, or by the existence of innumerable precedents. Besides, the judges in criminal causes were always far more numerous, so that the orator, instead of addressing himself to a few persons, in reality spoke to a small assembly. Even yet however, in all cases which involve great principles, or which possess intrinsic elements of interest, as well as in reply, the forensic orator has full opportunity for the display of the highest rhetorical ingenuity and skill. It may also be observed, that as all courts of justice are open to the public in this country, and as important cases always attract a large audience, the speaker though in form only addressing a few persons, and sometimes even a single person, with whom the decision rests, is nevertheless actually addressing a large body. This was also the case at Rome, where the judices were frequently few in number, but the bystanders were many.

Some of the public orations of Demosthenes and Cicero are noble specimens of antient eloquence, senatorial and forensic. The eloquence of antiquity indeed generally occupies a more elevated place than that which can be claimed for modern eloquence. The one is the result of profound and incessant study; the other too frequently the result of hasty and extemporaneous effort.

The influence which the great orators of Greece and Rome were enabled to exercise, in the popular assemblies, in the senate, and in judicial cases, gave to oratory a high degree of importance as a branch of liberal education; and accordingly those who aspired to political distinction, either at Athens or Rome, qualified themselves to appear as public speakers by the most assiduous industry, and by following the instruction of the best masters of their art. The painful labour by which Demosthenes overcame the impediments which nature seemed to have put in the way of his becoming an orator, and the unwearied diligence of Cicero (*Brutus*, c. 90, &c.), are well known. But in modern times little or no attention has been bestowed on oratory as a separate branch of study, and eloquence has come to be more admired as one of the rare gifts of nature than sought after as one of the fruits of art. This seems the principal reason why the orations transmitted to us from antiquity have been so rarely approached, and still more rarely equalled, even by the most distinguished modern speakers, and even in those states whose constitutional forms permit and invite the exercise of oratorical power.

The diffusion of opinions and arguments by means of the press has perhaps contributed in some degree to the present neglect of oratory; for a speaker is mainly known to the public through the press, and it is often more important to him to be *read* than to be *heard*.

Still the power of oratory, in all modern constitutions into which the democratic element enters, is considerable enough to induce any person who has the requisite gifts of nature to cultivate oratory as an art; and it is rather singular that those who aspire to political distinction in states which have such constitutions, do not prepare themselves for their career by a special study. One reason may be that rhetoric, along with many other antient studies, has been banished from our course of instruction, so that even he who has the desire cannot find the opportunity of perfecting himself under a master. He therefore attains such excellence as he may, solely by practice in those places which under another system he would not have approached without due preparation. The great Roman orator, though disciplined for his profession by assiduous study, left Rome after he had been practising for two years at the bar, and had already begun to be known, for the purpose of improving himself under the best Grecian masters.

Pulpit oratory was unknown to the antients, being the growth of later times. It has for its chief aim to impress men with their duty as moral and religious beings; to deter from vice and excite to the pursuit of virtue; to encourage, to elevate, and to awe, by the prospects of immortality. As the topics with which it is conversant are of transcendant importance, and ought to be profoundly interesting to all classes of mankind, we can scarcely conceive how oratory could find a more favourable sphere. It admits of nearly every diversity of oratorical excellence; but the chief qualities which ought to be exhibited by the preacher are sincerity, solemnity, and fervour, combined with moral dignity. That so few should have excelled in this department of eloquence must be matter of wonder, as well as of regret. No subjects are so easily susceptible of being made impressive as those which it is the duty of the preacher to proclaim; and every means ought to be employed by which the truths of revelation may be made to penetrate more deeply into the heart of man.

Mob oratory is principally directed to the producing of excitement. Being intended to influence minds which are little cultivated or refined, it requires the plainest and least ornamental style. Here the maxim of Demosthenes formerly alluded to might, as has been hinted, be admitted in all its force. The utmost familiarity of thought and allusion is admissible; and it must be the care of the speaker to give utterance to his thoughts in brief sentences. He must place himself on a level with those whom he addresses; nor can he expect to gain them over to his own purposes without seeming to partake of their prejudices.

The oratory of the stage differs from every other kind of oratory. Its characteristic peculiarity is imitation. Its design is to represent human nature, as embodied in particular individuals and modified by particular circumstances. In order to excellence in this art, an extensive acquaintance with the general principles of human nature is requisite,

and also an accurate knowledge of their workings and developments in individual character. Success must be measured by the closeness of the resemblance. We now proceed to speak more particularly of that part of oratory which relates to *delivery* or, as we shall here term it, *Elocution.*

Elocution is that pronunciation which is given to words when they are arranged into sentences and form discourse. It includes the tones of voice, the utterance, and enunciation of the speaker, with the proper accompaniments of countenance and gesture. The art of elocution therefore may be defined to be that system of rules which teaches us to pronounce written or extemporaneous composition with justness, energy, variety, and ease; and agreeably to this definition, good reading or speaking may be considered as that species of delivery which not only expresses the sense of the words so as to be barely understood, but at the same time gives them all the force, beauty, and variety of which they are susceptible

The Greeks and Romans paid great attention to the study of elocution, and there can be no doubt that their most celebrated orators attained to a high degree of excellence in this branch of their art; but they have left nothing on record which shows that they had made a minute analysis of the speaking voice. They did indeed distinguish its different qualities by such terms as hard, smooth, sharp, clear, hoarse, full, slender, flowing, flexible, shrill, and rigid. They were sensible to the alternations of heavy and light in syllabic utterance: they knew the time of the voice, and regarded its quantities in pronunciation: they gave to loud and soft appropriate places in speech: they perceived the existence of pitch, or variation of high and low; and noted further that the rise and fall in the pronunciation of individual syllables are made by a *concrete* or continuous slide of the voice, as distinguished from the *discrete* notes produced on musical instruments. They designated the pitch of vocal sounds by the term *accent*, making three kinds of accents, the acute, the grave, and the circumflex, which signified severally the rise, the fall, and the turn of the voice, or union of acute and grave on the same syllable. But beyond this they did not go, and it was left to modern inquirers to give that clear and full description of the elements of speech, on which alone any definite instruction can be founded. For the advance which has been made in elocutionary science in modern times we are indebted to the useful labours of Steele, Odell, Walker, Thelwall, Chapman, Smart, and Rush, especially to the last, who has done much to perfect what was begun by others, and whose 'Philosophy of the Human Voice'* contains a more minute and satisfactory analysis of the subject than is to be found in any other work. From his book chiefly we shall borrow the substance of this article.

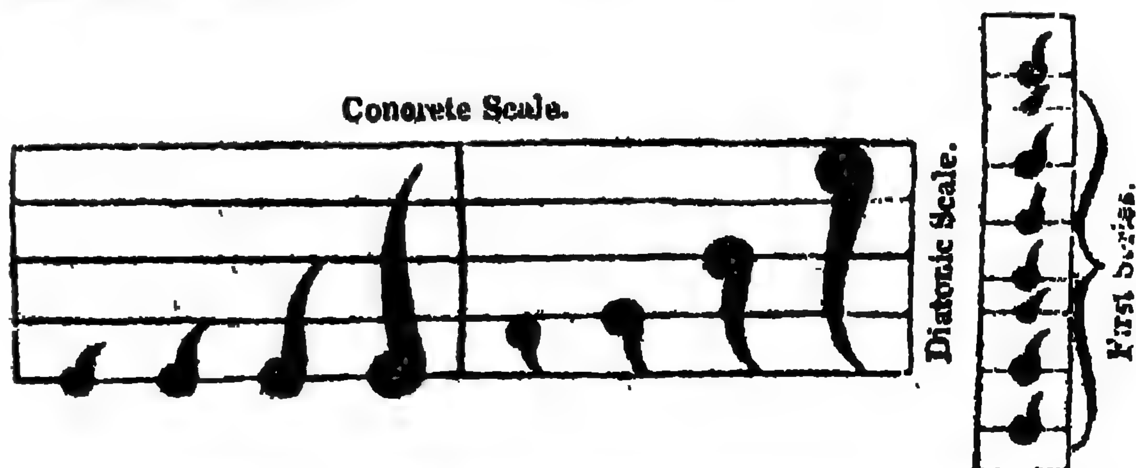
When the letter *a*, as heard in the word *day*, is pronounced simply as an alphabetic element, without intenseness or emotion, and as if it were a continuation and not a close of utterance, two sounds are heard continuously successive: the first has the nominal sound of this letter, and issues from the organs with a certain degree of fulness; the last is the element *e*, as heard in *eve*, which gradually diminishes until its close. During the pronunciation, the voice rises, by the concrete or continuous movement, through the interval of a tone, the beginning of the *a* and the termination of the *e* being severally the inferior and superior extremes of that tone. This sound commences full and somewhat abruptly, and gradually decreases in its upward movement, till it finally dies away in the upper extreme of the tone, having the increments of time and rise, and the decrement of fullness, equally progressive. The first portion therefore, or base of this sound, is called the *radical movement*, and the second portion the *vanishing movement*. This sound is called a concrete, or slide, to distinguish it from musical sounds, which (in their *pure* character) continue for a given space of time on a certain point of the scale, and then leap, as it were (*discretely*), to another point either higher or lower. These slides may extend through the space of a tone, or they may be carried up to any point on the scale to which the voice can attain, those intervals which are the most distinctly recognisable by the ear and the most easy of execution being the tone (or second), the third, the fifth, and the octave. The direction also which they take may be either upwards or downwards, the full opening radical however always occupying the first place, and the vanish the second. It also frequently happens that there is a union of the upward and downward, or of the downward and upward movement, on the same syllable: these are called *waves* or *circumflexes;* they may rise and fall through the extent of a tone, or of a third, or of any wider interval of the scale; they are then called *direct* waves: or they may fall and rise through the same extent of pitch, being then called *indirect* waves; they may be *equal*, having their constituent rise and fall through the same extent of pitch; or they may be *unequal*, having either the ascent or the descent longer than the other part.

The succession of the seven sounds of any one series, to which the octave is usually added, is called the Natural or Diatonic Scale. In speech, as in music, it consists of five tones and two semitones, the latter being the spaces between its third and fourth and its seventh and eighth degrees. But a progression may also be formed by semitones; these have only half the extent of pitch which the full tones have: like them, they may be carried upwards or downwards, and they often occur in the form of waves. They serve for the expression of animal distress.

But the succession of discrete sounds may be exhibited under still more minute divisions. These consist of a transition from place to place in pitch, over intervals much smaller than a semitone, each point being, as it were, rapidly touched by a short and abrupt omission of voice. This description may be illustrated by that noise in the throat which is called *gurgling*, and by the neighing of a horse. The analogy here regards principally the momentary duration, frequency, and abruptness of sound, for the gurgling is generally made by a quick iteration in one unvarying line of pitch, whereas in the scale now under consideration each successive pulse of sound is taken at a minute interval above the last, till the series reaches the octave. The precise extent of these small intervals it is very difficult to estimate. They may however be carried concretely through the wider intervals of the scale, provided they do not lose their distinctive character of momentary time and abruptness of utterance. These concretes are used both in laughter and in crying. In the descending scale, the direction not only of the radicals but of the vanishes is downwards. *Intonation* is the act of performing the movements of pitch through the several scales.

There are then *four* scales of pitch for the speaking voice:—

1. The *Concrete*, in which from the outset to the termination of the voice there is no appreciable interval, or interruption of continuity.
2. The *Diatonic*, the transitions of which are principally by whole tones.
3. The *Semitonic*, or *Chromatic*, consisting of an entire succession of semitones.
4. The *Tremulous*, consisting of minute intervals smaller than the semitone.



The *alphabet* is, in our grammars, usually divided into vowels, consonants, mutes, and semivowels; but it will be more useful to class the elements according to their use in intonation. As the number of these elementary sounds in the English language exceeds the literal signs, and some of the letters are made to represent various sounds without any rule of discrimination, it is necessary to use short words of known pronunciation, containing the elementary sounds, with the letters which represent them marked in italics. The elements of articulation are thirty-five, and they may be arranged under three general heads.

I. The first division embraces those sounds which display

* Second edition; 8vo. Philadelphia, 1833. A copy of this will be found in the library of the British Museum, where the student may also consult Mr. Steele's 'Essay towards Establishing the Melody and Measure of Speech, to be expressed and perpetuated by peculiar symbols,' London, 1775. The second edition was published in 1779, with the title of 'Prosodia Rationalis.' Mr. Odell's work is entitled 'An Essay on the Elements, Accents, and Prosody of the English Language,' 12mo., London, 1806.

the properties of the radical and vanish in the most perfect manner. They are twelve in number, and are heard in the usual sound of the separated italics in the following words:—*a*-ll, *a*-rt, *a*-n, *a*-le, *o*-ur, *i*-sle, *o*-ld, *ee*-l, *ou*-ze, *e*-rr,* *e*-nd, *i*-n.† From their forming the purest and most plastic material of intonation, these are called *Tonic* sounds. They have a more musical quality than the other elements; they are capable of indefinite prolongation; admit of the concrete and tremulous rise and fall through all the intervals of pitch, and may be uttered more forcibly than the other elementary sounds, as well as with more abruptness.

II. The next division includes a number of sounds possessing variously among themselves properties analogous to those of the tonics, but differing in degree. They amount to fourteen, and are marked by the separated italics in the following words:—*B*-ow, *d*-are, *g*-ive, *v*-ile, *z*-one, *y*-e, *w*-o, *th*-en, a-*z*-ure, si-*ng*, *l*-ove, *m*-ay, *n*-ot, *r*-oe.

From their inferiority to the tonics in all the emphatic and elegant purposes of speech, whilst they admit in some measure of being intonated, or carried concretely through the intervals of pitch, they are called *subtonic* sounds.

III. The remaining nine elements are aspirations, and have not that sort of sound which is called vocality. They are produced by a current of the whispering breath through certain positions of the enunciative organs. They are heard in the words—U-*p*, ou-*t*, ar-*k*, i-*f*, ye-*s*, *h*-e, *wh*-eat, *th*-in, pu-*sh*.

As they admit of little or no pitch, and supply no part of the concrete when breathed among the constituents of syllables, they are termed the *Atonic* sounds.

The name of *Abrupt* sounds is also given to three of the subtonics and three of the atonics, namely *b, d, g, p, t, k*, since they confer an *explosive* character on the following tonic, the breath bursting out after a complete occlusion.‡

In conformity to the above division of the letters, and with especial reference to the time which is occupied in pronunciation, syllables are divided into three classes—1st, *Immutable*, such as *at, ap, ek, hap*-less, *pit*-fall, ac-*cep*-tance; 2nd, *Mutable*, as *yet, what, grat*-itude, des-*truc*-tion; 3rd, *Indefinite*, as *go, thee, for, day, man, till*, de-*lay*, be-*guile*, ex-*treme*, er-*ro*-neous. It is the peculiar nature of this last class of syllables, that to whatever necessary degree their quantity is prolonged, their character is still preserved, while the mutable and the immutable in some cases almost lose their identity by too great an addition to their time. The use of these distinctions will appear in the sequel.

Thus much having been premised, it will be the more easy to understand the general divisions of vocal sound. All the varieties of sound in the human voice may be referred to the following general heads:—

Quality, Force, Time, and *Pitch*.§

I. The terms by which the *Quality* or kind of voice is distinguished are rough, smooth, harsh, full, thin, slender, soft, musical, and some others of the same metaphorical structure.

There are three different sorts of voice, the *natural*, the *falsette*, and the *orotund*, to which must be added the *whisper*, which, strictly speaking, is not *voice*. The *natural* is that which we employ in ordinary speaking. It includes a range of pitch from the lowest utterable sound up to that point at which the voice is said to break. At this point the natural voice ceases, and the higher parts of the scale are made by a shriller kind, called the *falsette*, of which the cry, the scream, the yell, and all shrillness are various modes. The name of *orotund* (from *os rotundum*) is given to that natural or improved manner of uttering the elements, which exhibits them with a fulness, clearness, strength, smoothness, and a ringing or musical quality rarely heard in ordinary speech, and which is never found in its highest excellence except as the effect of long and careful cultivation. This voice is highly agreeable to the ear; it is possessed by actors of eminence, and is peculiarly adapted to set forth the beauties of epic and tragic composition. The *whisper* is the constituent of the atonic elements; but all the tonics, and the greater part of the subtonics, may likewise be uttered in this mode of sound. The subtonics *v, z, w, th*-en, *zh*, when whispered, are not respectively different from the atonics *f, s, wh, th*-in, *sh*.

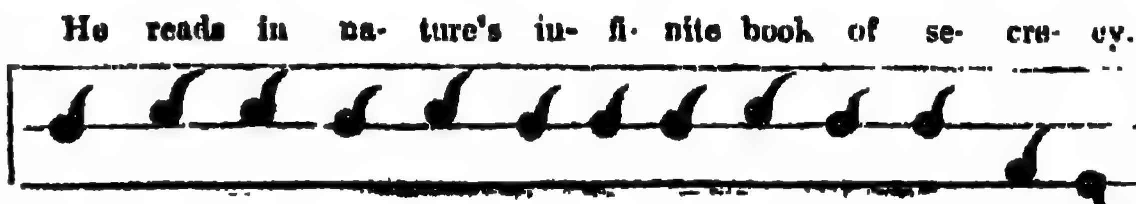
II. For the specifications of *Force* we use the words strong, weak, feeble, loud, soft, forcible, and faint. These are indefinite in their indication, and without any fixed relationship in degree.

III. *Time*, in the art of speaking, is divided into long, short, quick, slow, and rapid. These distinctions may suffice for the common purposes of discourse; if more precision is required, a notation will be found in Mr. Steele's *Prosodia Rationalis*. The distinction of immutable, mutable, and indefinite syllables has reference to time, and has been already treated of.

IV. The meaning of the term *Pitch*, as applied to speech, has been already explained.

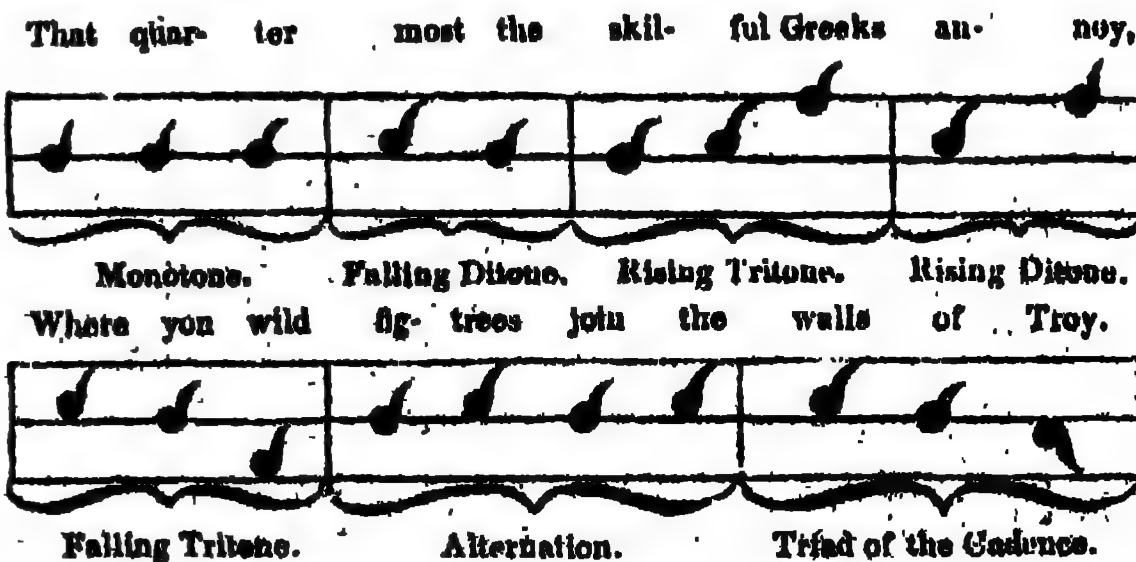
We come now to the application of these elements and distinctions to the practical purposes of reading and speech.

In plain narrative or description, the concrete utterance of each syllable is made through the interval of a tone, and the successive concretes have a slight difference of pitch relatively to each other. The appropriation of these concretes to syllables, and the manner in which the succession of their pitch is varied, are exemplified in the following notation:—



If these lines and the enclosed spaces be supposed, each in proximate order, to denote the difference of a tone in pitch, the successions of the radical points, with their issuing vanish, will show the places of the syllables of the superscribed sentence in easy and unimpassioned utterance, though it is not denied that a somewhat different arrangement might also be agreeable. The perception of the successions here exemplified is called (in a restricted meaning of the term) the melody of speech.

In simple phraseology, which conveys but little feeling or emphatic sentiment, most of the syllables, except one or two of the last in the sentence, consist of the upward radical and vanishing tone. The succession of these concrete tones is made with a variation of pitch, in which any two proximate concretes never differ from each other more than the interval of a tone, nor do there occur more than three successive tones in one direction either upwards or downwards. This is called the *diatonic melody*. The rise of each separate syllable is called the *concrete pitch* of melody, and the place which each syllable assumes above or below the preceding, the *radical pitch*. The *current* melody of sentences in plain discourse admits of considerable variety, but the forms of radical pitch are all reducible to a limited number of aggregates of the concrete tones, which may be called the *phrases of melody*. Their forms are pointed out in the notation of the following lines:—



The *melody of the cadence*, as distinguished from the current melody, is formed on the two or three last syllables of a sentence, and is effected by a descent of radical pitch through three conjoint degrees, with a downward concrete always on the last, and frequently on the preceding. One form of the cadence has been illustrated in the sentence, the notation of which has been given above; but there are

* The writer of this article has personal opportunity of knowing that by this word Dr. Rush meant to designate that sound which Mr. Cull represents by *her*.

† If *oi* or *oy*, as in *voice* and *boy*, be added as perhaps they ought, the number of the tonics will be thirteen.

‡ It is difficult to decide on the analysis of the elementary sounds represented by the alphabet. That of Dr. Rush is given in the text. The following has been furnished to the writer of this article by Mr. Cull, and, although not free from objections, is more complete.

I. Vowels, as heard in the following syllables:—*all, arm, an, ale, end, eel, her, isle, in, old, ooze, on, us, cube, pull, our, oil*.

II. Consonants. 1. *Voice Consonants*:—*be, do, go, lo, me, no, roe, eat, we, ye, zone, sing, azure, then, jew*. 2. *Voiceless Consonants*:—*up, at, ark, if, hope, quit, sin, chin, shin, thin, when*. In all forty-three elements.

§ To these Dr. Rush adds a fifth, namely, *Abruptness*; but this appears to be resolvable into force and time.

various forms according to the component parts and the sense.

Plain declarative sentences generally take one form or other of the cadence, in order to mark the satisfactory close of the period; and downward concretes are also frequently introduced into what are called loose sentences, to denote that the sense is complete, and that the succeeding clause does not modify that which precedes it. Where, on the contrary, the sense is suspended, as it most commonly is in the middle of a sentence, the concretes must have an upward direction.

For conveying the peculiarities of sentiment or feeling, or, in other words, for the *expression of speech*, a much more varied apparatus is necessary. This expression is effected by quality, time, pause, melody, pitch, the waves, the semitones, the tremor, force, and rhythm, all which are only so many forms of the four general divisions of vocal sound above specified.

I. Most of the elements which range under the general head of *Quality* have already been enumerated. It must however be remarked that they are susceptible of combination with the various modes and degrees of force, time, and pitch. In short, quality of voice must necessarily be united with some of the degrees of the other genera; for, whatever be the kind, it will be either strong or weak; its time must be long or short; and it must be of some definite radical or concrete pitch. Certain qualities of the voice are however exclusively congenial with particular conditions of these other accidents; thus smoothness will more generally affect the moderate degrees of force.

II. *Time.*—The degrees of duration of the voice represented by the terms long, short, and the rate by quick and slow, are among the most effective means of expression; rage, mirth, raillery, and impatience affecting a quick time; and slowness of time being the symbol of sorrow, grief, respect, veneration, dignity, apathy, contrition, and all other sentiments which embrace the idea of deliberation. A slow time of discourse, if not made by long quantities on single syllables, would be offensive from its pauses; these two forms of time therefore necessarily involve each other. Slowness of time and long quantity are generally joined with the element of the wave, since the return, or contrary flexure of intervals, is one of the means for producing an extension of time without destroying the equable concrete of speech, or, in other words, without passing into song. The wave of a tone will be perceived in the dignified and appropriate utterance of the syllables marked in italics in the following lines:—

'*Pardon* me, thou *bleeding* piece of earth,
That I am meek and gentle with these butchers.'

'*Hail, holy* light, offspring of heaven, first-*born*,
Or of the *eternal co-eternal* beam,
May I express thee, *unblamed*?'

III. The use of *Pause* for the more conspicuous display of sense and sentiment, by separating certain words or aggregates of words from each other, is of great consequence in elocution, but cannot be gone into at length in this article. To these pauses the grammatical points are by no means a sufficient guide. [PUNCTUATION.]

IV. A comprehensive account of *Melody* would properly represent it as produced by a variation in the time, pauses, force, and pitch of the voice, since the well-appointed uses and dispositions of these accidents make up the agreeable impression of speech; but we use it here as relating solely to the successions of radical pitch. Under this head it may be remarked that a predominance of the *monotone* is suited to feelings of dignity, grief, tenderness, solemnity, and serious admonition; that the *alternate phrase* well describes the earnest excitement necessarily produced by the rapid succession of incident; and that a *progression* gradually rising and falling through *the whole compass of the voice* corresponds with a wide variation of force in the sentiment. For illustrations of these modes see Dr. Rush's *Philosophy of the Voice*, pp. 112, 144.

V. *Pitch.*—Discrete pitch is illustrated by the word *must* in the following passage. As it is a syllable which does not admit of prolongation, it is raised discretely a third above the preceding:—

'If I *must* contend, said he,
Best with the best, the sender, not the sent.'

We have an example of a *concrete* rising *fifth* on *beau-*, and of a *discrete third* on *mor-*, in the following:—

And beau- ty im- mor- tal a- wakes from the tomb.



If we suppose that the following words are spoken *interrogatively*, and that they express surprise, the concrete rising fifth must be given to the emphatic syllables:

Give Brutus a statue with his ancestors?

If, on the other hand, the line be read as a *command*, the direction of the concretes will be downwards.

On the word *know*, in the following clause, not only does the voice descend concretely a third or a fifth, but the descent begins discretely a third above the preceding word:—

We know what we worship, for salvation is of the Jews.

As the diatonic melody is suited to plain narration and description, so will the emphasis be the more strongly marked in proportion to the wider extent of the intervals, whether of concrete or of discrete pitch, which are employed. It may also be remarked in general, that the upward concretes denote interrogation, doubt, or what is concessive, conditional, hypothetical; the downward concretes denote what is strong, certain, authoritative, as also wonder, admiration, surprise, and exclamation, when not conjoined with an interrogative meaning.

VI. *The Wave* is a very frequent element of expression, and performs high functions in speech. In its minor forms it is used to give length and emphasis to syllables and dignity to utterance; in its wider intervals it is admirably expressive of irony and derision. Thus the irony of the following passage can be brought out only by the indirect wave of a fifth in both places in which it occurs:—

But it is foolish in us to compare Drusus Africanus and ourselves with Clodius: all our other calamities were tolerable, but no one can patiently bear the death of Clodius.

VII. *The Semitones.*—These are used for the expression of complaint, pity, grief, plaintive supplication, and other sentiments congenial with these. The intonation by the concrete semitone is universally the symbol of nature for animal distress. It affects generally a slow time and long quantity in utterance, and is therefore most commonly heard in the form of the wave. The interjective exclamations of pain, grief, love, and compassion, are prolongations of the tonic elements on this interval; but it may be executed on the short time of immutable syllables, such as *cup*. The appropriate utterance of the following line will exhibit the wave of the semitone on the most important syllables, *poor* and *old* being distinguished by direct unequal waves of the same interval. It must be taken as an isolated line, and not in conjunction with the verse of which it forms part:—

Pi- ty the sor rows of a poor old man.



VIII. *The Tremor.*—When the tremulous function is made through the second, third, fifth, or octave, or through the wave of these intervals, it joins the sentiment of derision, mirth, joy, or exultation, to that of interrogation, surprise, command, or scorn, conveyed by the smooth concrete of those intervals. In short, it is the introduction into speech of what is transferable in the function of laughter, and it adds thereto all the meaning and force of its satisfaction. Thus

'Thou art the ruins of the noblest man,
That ever lived in the tide of times.'

There is a sentiment of exultation and a superlativeness of compliment in this eulogy, which cannot be properly expressed by the smooth movement of the concrete; but if the first syllable of the emphatic word *noblest* be uttered with the tremulous intonation of the wave of the third or second, this will give the vocal consummation to the feeling which suggests the exceeding measure of the praise.

The *chuckle* is an example of a somewhat similar application.

When the tremor is formed of a single tonic, in the semitone or its waves, it constitutes the function of crying; and when employed in the syllabic intonation of the chromatic

melody; it sets a more marked distinction on those emphatic words which express the sentiments of tenderness, grief, supplication, and other connatural states of feeling. This may be illustrated on the emphatic syllables of the line just quoted:—' Pity the sorrows,' &c.

IX. The application of the different degrees of *Force* to the purposes of expression is almost too obvious to require illustration. Thus the *distance* of a person spoken to is pictured by loudness, and *nearness* by abatement of force; *secrecy* muffles the voice against discovery, and *doubt* adopts the subterfuge of an undertone. *Certainty* and *anger* assume force and strength. All sentiments which are *unbecoming* or *disgraceful* smother the voice into softer degrees, in the desire to conceal even the voluntary utterance of them. *Joy* is loud, and so are *bodily pain*, *fear*, and *terror*.

Such are some of the uses of force when applied to phrases, or to one or more sentences, in order to distinguish them from adjacent phrases or sentences in discourse. There are other applications of it, to single words, to syllables, and to certain parts of the concrete movement, into which, though of some consequence, it is not within the purport of this article to enter. They will be found described in Dr. Rush's *Philosophy of the Voice.*

The common idea of *Emphasis*, it may be remarked, is that of mere force; but it is more correctly defined to be the expressive but occasional distinction of a syllable, and consequently of the whole word, by one or more of the specific modes of time, quality, force, and pitch. Most of these have been illustrated under the above heads.

X. *Rhythm* is one of the applications of force and quantity. It may be defined to be the metrical arrangement of speech. It is not mainly dependant on custom or on the genius of any language whatever, but arises from the very manner in which speech is produced, and is as involuntary as the throb or remission of the pulse, or the inhaling and respiration of the breath. In the formation of speech there is a regular action and reaction of the organs which produce it. To form a *heavy* syllable, or one which has accentual stress upon it, these organs are necessarily placed in a certain position; and from their very nature it is necessary that, before they form another heavy syllable, they should recover their first position; but the time which is occupied in this recovery of their position is not always lost to the purposes of speech, for it may be filled up with one or more syllables, which have *no* stress, and which are therefore very properly denominated *light;* if it is not filled up in this way it is a pause or rest. To illustrate this, let us take the words—

One, two, three, four, five.

These monysllables, if distinctly and deliberately pronounced, have two peculiarities; each has the organic stress or emphasis, and each has a pause after it. Let these pauses be filled up with the light syllable *and;* and then the two lines, viz.:—

One and two and three and four and five and

and

One, two, three, four, five,

will be of exactly the same length as to time in music, or rhythm in speech, the syllable *and* occupying no more time than what necessarily intervenes between the syllables under organic emphasis.

This alternate action and reaction of the organs of speech was called by the Greeks by the significant terms *Thesis* and *Arsis:* the former denoting the *setting down* of a syllable, as the setting down of the foot in walking; the latter denoting the *raising of it up,* like the lifting of the foot from the ground; the former producing the heavy syllables, the latter the light ones.

The weight of syllables, or in other words, the stress with which they are enunciated, must be carefully distinguished from their quantity, since the weight or stress with which the syllable is uttered does not always correspond to the relative time which the utterance requires. Thus in the word *pensive*, the syllable *pen* is the heavier, but it is not longer than the syllable *sive*. So also in the word *inward*, there is an equality of time in the two syllables, but not of weight. In *banish*, *banner*, *banter*, the first syllable is heavy but short; in *paper*, *taper*, *vapour*, it is both heavy and long; and the same observation applies to *misery*, *middle*, *mistress*, compared with *miser*, *minor*, *mitre*.

Those emphatical divisions into which, from the very nature of the organs, all speech naturally falls, are called by writers on this subject *cadences.** Every full *spoken* cadence consists of a heavy syllable, and of one or more light ones, but pauses may be substituted to make up the time which any of these syllables would occupy. Measure, or metre, therefore in speech naturally distributes itself into two kinds: common measure, which, according to Mr. Steele, is the allotment of two crotchets or their equivalents to each cadence; and triple measure, which is the allotment of three crotchets or their equivalents to each cadence; emphasis however will sometimes prolong the duration of a cadence beyond the allotted time, just as an *ad libitum* is allowed in solos in music. Without entering further into minute distinctions or exceptions, the following may serve as specimens of each kind. This mark § indicates a short pause, this ‖ a longer, and this ¶ a still longer one:—

Common Measure.

So § | spoke the | guardian | § of the | Trojan | state, |
| Then | rush'd im- | petuous § | through the | Scæan | gate; |
| Him | Paris | follow'd | § to the | dire a- | larms: |
Both § | breathing | slaughter, § | both re- | solv'd in | arms.' |
Pope's *Iliad*, b. vii.

' Straight mine | eye § hath | caught new | pleasures, |
Whilst the | landscape | round § it | measures, |
Russet | lawns § and | fallows | grey, |
Where the | nibbling | flocks § do | stray; |
Mountains § | on whose | barren | breast
The | labouring | clouds § do | often | rest.' |

Triple Measure.

'‖§ At the | close of the | day § when the | hamlet is | still, §
And | mortals § the | sweets of for | getfulness | prove; ‖ |
¶ When | nought but the | torrent § is | heard on the | hill, §
And | nought but the | nightingale's | song § in the | grove.' ‖ |

If this system of measuring verse were adopted, the prosody not only of our own but of the learned languages would be greatly simplified. The list of feet which is usually given at the beginning of the 'Gradus ad Parnassum,' would be reduced to four or five; we should hear of no such unnatural foot as an iamb or an anapæst, and the syllable at the beginning of an iambic line would either of itself form a cadence, or would be the close of a cadence, of which a pause or the last syllable of the preceding line would form the commencement. Those lines of Anacreon would then be reduced to the trochaic measure, thus:—

‖ Θελ- | ω λε- | γειν 'Α- | τρειδας, |
‖ Θελ- | ω δε | Καδμον | ᾳδειν, |
§ ἁ | βαρβι- | τος δε | χορδαις |
‖ ε- | ρωτα | μουνον | ηχει. |

From the above examples it is clear that there is a regular rhythmus in poetry; and it cannot be necessary to insist on this being strictly attended to, if we would read verse in an agreeable and expressive manner. Prose also has its rhythmus, for the alternate action and reaction of the organs of speech necessarily proceeds, whether what is spoken be prose or verse; and the only difference (so far as sound is concerned) between these two species of composition is, that verse consists of a regular succession of similar cadences, or of a limited variety of cadences, divided by grammatical pauses and emphasis into proportional clauses, so as to present sensible responses to the ear at regular proportioned distances; prose, on the other hand, is composed of all sorts of cadences, arranged without attention to obvious rule, and divided into clauses which have no obviously ascertained proportion, and present no responses to the ear at any legitimate or determined intervals.

There is nothing which contributes more to the rhythmical flow of prose than giving a light sound to monosyllables. If this be done, they then form the latter part of cadences, of which either pauses, or emphatical monosyllables, or the emphasized syllables of longer words form the beginning; but if they be pronounced heavy, it is then necessary that they should themselves form the beginning of new cadences, which is the occasion of many pauses being introduced, and of a heavy and halting character being communicated to the piece. Thus the clause 'Let not your | heart be | troubled,' | will be rhythmical if *your* be thus made a light syllable; but the effect will be very different if it be read thus:—' Let not | your § | heart be | troubled.' |

Of the advantage of cadences in triple measure we have a beautiful illustration in the first verse of the 136th Psalm:—

‖'O | give ‖ | thanks unto the | Lord; ‖ | § for he is | good, ‖ | ‖ for his | mercy en- | dureth for | ever.' ‖ |

* More properly *rhythmical cadences*, to distinguish them from the cadences of *melody*. Mr. Cull would prefer the term *measures*.

On the other hand, a succession of heavy syllables, with a pause intervening, is one of the most expressive forms of emphasis both in prose and verse. Thus the following line from Milton would lose all its force, if read so as to form only the usual number of six cadences: emphasis prolongs it to eight, thus:—

'Rocks, || caves, || lakes, || fens, || bogs, || dens and | shades of | death.' ||

Independently of its agreeable effect upon the ear, and its power as an element of expression, there can be no doubt that, as rhythm arises from the very manner in which speech is produced by the organs, he who speaks agreeably to its laws will speak easily to himself. The practice of reading or speaking aloud, with a due attention to the rhythmus, may even be recommended as a means of improving the health, since it brings into regular and natural action the muscles of the face, the throat, and the chest; and no attempt completely and permanently to remove impediments of speech can be successful, which is not based on the principle here developed.

(A succinct account of rhythm will be found in Wood's *Grammar of Elocution*, ch. iv. and v.; and the subject is treated much more at length in Steele's *Prosodia Rationalis;* in Thelwall's *Illustrations of English Rhythmus;* in Roe's *Principles of Rhythm;* and in Chapman's *Music, Melody, and Rhythmus of the English Language*, 8vo, Edinburgh, 1819; as well as in his *Rhythmical Grammar*, 12mo, 1821.)

Method of Training and Strengthening the Voice.—In order to read and speak well, it is necessary to have all the vocal elements under complete command, so that they may be duly applied whenever they are required for the vivid and elegant delineation of the sense and sentiment of discourse. The student therefore should first practise on the thirty-five alphabetic elements, in order to ensure a true and easy execution of their unmixed sounds. This will be of more use than pronouncing words in which they occur; for when pronounced singly, the elements will receive a concentration of the organic effort, which will give them a clearness of sound and a definite outline, if we may so speak, at their extremes, making a fine preparation for their distinct and forcible pronunciation in the compounds of speech. He should then take one or more of the tonic elements, and carry it through all the degrees of the diatonic and concrete scales, both in an upward and a downward direction, and through the principal forms of the wave. He should next take some one familiar sentence, and practise upon it with every variety of intonation of which it will admit. He should afterwards run through the phrases of melody, and the forms of the cadence; and lastly he should recite, with all the force that he can command, some passage which requires great exertion of the voice. If he would acquire power and volume of utterance, he must practise in the open air, with his face to the wind, his body perfectly erect, his chest expanded, his tongue retracted and depressed, and the cavity of his mouth as much as possible enlarged; and it is almost unnecessary to add that anything which improves the general tone of the health will proportionably affect the voice. If to this elementary practice the student add a careful and discriminating analysis of some of the best pieces which our language contains, both in prose and verse, and if he strenuously endeavour to apply to them all the scientific principles which he has learned, there can be no doubt that he will acquire a manner of delivery, which will do ample justice to any subject on which he may be called to exercise his vocal powers.

Intimately connected with the subject of delivery is that of *Action*. Oratorical action has been defined to be the just and elegant adaptation of every part of the body to the nature and import of the subject on which we are speaking. As every man who feels his subject will necessarily have some action, it is of consequence that it should be graceful and significant. The first point to be attained is to avoid awkward habits, such as resting the chief weight of the body first on one foot and then on the other, swinging to and fro, jerking forward the upper part of the body on every emphatic word, keeping the elbows pinioned to the sides, and sawing the air with one hand with one unvaried and ungraceful motion. As for the attainment of excellences, more specific rules must be sought for in professed treatises on the subject, but the following general directions will be found to embrace much that is useful: 'Keep the trunk of the body erect; let your hands be at liberty; feel your subject, and the action will come; recollecting at the same time that the right hand is essentially the instrumen of action, and that the left should be used only as subordinate to it.'

As gesture is used for the illustration and enforcement of language, so it should be limited in its application to such words and passages as admit of or require it. A judicious speaker will not only adapt the general style and manner of his action to the subject, the place, and the occasion, but even when he allows himself the greatest latitude, he will reserve his gesture, or at least the force and ornament of it, for those parts of his discourse for which he also reserves his boldest thoughts and his most brilliant expressions.

(On the subject of *action* very minute directions will be found in Austin's *Chironomia*, London, 4to., 1806; see also Chapman's *Music of the English Language*, p. 112; and Walker's *Elements of Elocution.*)

ORB, ORBIT. The word *orbis* signifies the circumference of a circle or of any round body; *orbs* among the antient astronomers meant the vast crystal spheres in which the heavenly bodies were supposed to be placed and with which they revolved; hence orb came to be used for a sphere, as when the sun is called the *orb of day*. The word orbit now means the relative path [MOTION] in which a planet travels round the sun or a satellite round its primary.

We should perhaps rather say that by the orbit of a planet, technically speaking, is meant the approximate path, circular or elliptic, in which the planet may for a time be supposed to move without sensible error. Thus when for some particular purpose, as the explanation of the seasons, we say the earth moves round the sun in a circle, we make an orbit which is exact enough for that purpose; and when, to explain the equation of time, we are obliged to have recourse to a more exact supposition, that of an elliptic motion, we are still said to speak of an orbit of the earth. But if we were to speak of the closely-folded interlacing spiral in which the centre of the earth actually moves round the sun, usage (and nothing else) would require us, if we would be understood, not to call this the orbit of the earth, but its real path, or real orbit, or some such distinctive term; for it is generally understood that the word orbit applies at most to the ellipse, which for a time does not differ sensibly from the real path. Theoretically speaking, this ellipse only touches the real path in one point; and the ellipse which most exactly tends to coincidence with the real path, consistently with satisfying other desirable conditions, is called the instantaneous ellipse. [GRAVITATION, vol. xi., p. 364.]

The *elements* of the orbit are those quantities by which the position and magnitude of the (*pro tempore*) orbit are fixed, such as the major axis and eccentricity, which determine its magnitude; the longitude of the node and inclination of its plane to the ecliptic, which determine the position of that plane in space; and the longitude of the perihelion, which determines the direction of the major axis. One more determining quantity is tacitly supplied in the condition that one focus of the ellipse is always to be in the centre of the sun. The only remaining element is the periodic time of the planet, or its time of revolution round the sun; this however is not a separate element for each planet, but, all the other elements being given, is known for every planet when it is known for any one.

ORBITELLO. [SIENA, PROVINCE OF.]

ORBITOLITES. [MILLEPORIDÆ.]

ORCANNETTIN, the colouring matter of alkanet root (*orcanette, lithospermum tinctorium*). It was extracted from the root by Pelletier, in 1814. It is procured by treating it with æther, and evaporating the solution. This substance has a resinous appearance, is fusible at 140° Fahr., and is of so deep a colour as to appear black. Water dissolves a mere trace of it, but alcohol and æther become of a red colour by dissolving it, and liquefied fatty substances are also coloured by it. Acetic acid and the alkalis dissolve it, the latter forming blue solutions; acetate of lead precipitates it blue, chloride of tin crimson, and the salts of iron and of alumina of a violet colour.

ORCHARD. Apples, pears, and cherries are the fruits principally cultivated in orchards. The term orchard is likewise used to signify enclosures in which filberts or walnuts are grown: the word yard is commonly used for similar spaces appropriated to the production of figs and grapes.

Orchards of apples and pears are more numerous, because more productive, on the old and new red-sandstone forma-

tions than on any other strata; a very large proportion of all the cider and perry that is manufactured is grown upon these soils. The principal orchards of England are in Devonshire, Somersetshire, Gloucester, Herefordshire, and Worcestershire; on the continent, in Normandy and in the vale of Stuttgard; and in America, in the New England states.

For an orchard of apple-trees, a deep unctuous soil should be selected, in a situation sheltered from the north and north-west winds, and open to the south and south-east; and a bank is preferable to a low spot, for not only is the blossom more liable to be injured by spring frosts where fogs and damp prevail, but the trees themselves become mossy, and perish from excess of moisture. Dr. Lindley (*Guide to Orchard and Kitchen Garden*, p. 117) recommends an early and effectual preparation of the soil, and the early transplanting of the trees: 'They cannot be removed from the nursery too soon after the wood has become ripe and the leaves have fallen off; for between this time and the winter many of them will make fresh roots, and be prepared to push forth their young shoots with more vigour in the spring than those whose transplanting has been deferred till a late period of the season.' Young trees will require to be watered if a dry spring should succeed the autumn of their planting, and their roots should be occasionally dug round and manured. Pruning is advantageous to young trees when skilfully performed, for it is desirable that branches should not be crowded together, especially in the centre of the tree: we are of opinion that it is seldom beneficial to old trees, excepting for the removal of misletoe; and recommend that under no circumstances should a pruner be employed who amputates large limbs and leaves wounds which injure the alburnum or sap-wood by exposing it to the atmosphere, and produce canker in the stem or principal branches. It may frequently be useful in an exposed situation to plant two or three rows of pear-trees to shelter the apple-trees from the prevailing storms, as pear-trees are on the whole less liable to suffer from wind than their more brittle kindred. The trampling of heavy cattle is at all times injurious to orchards.

For pear-orchards a lighter soil is desirable than for apples; the same rules may be observed for their planting and preservation. Washes for the destruction of the eggs of insects, and the preservation of orchard-trees from barking by hares, rabbits, and sheep, may be seen in Lindley, ut sup. 509; Forsyth *On Fruit Trees*, p. 333; Loudon's *Arboretum*, vol. ii., 903, &c.; for further information see articles APPLE, CIDER, and PEAR.

The principal cherry-orchards in England are in Buckinghamshire and Kent; from the latter county a large supply is sent to the London markets. In Alsace, Würtemberg, Berne, and Basle, 'kirschwasser,' an ordinary spirit, is distilled from cherries. There are likewise orchards of a small acid cherry called 'marasca' in the neighbourhood of Trieste, and also near Zara in Dalmatia, from which Maraschino is derived: in the Bergstrasse, near Heidelberg, there are cherry-orchards which furnish an early supply to the London market.

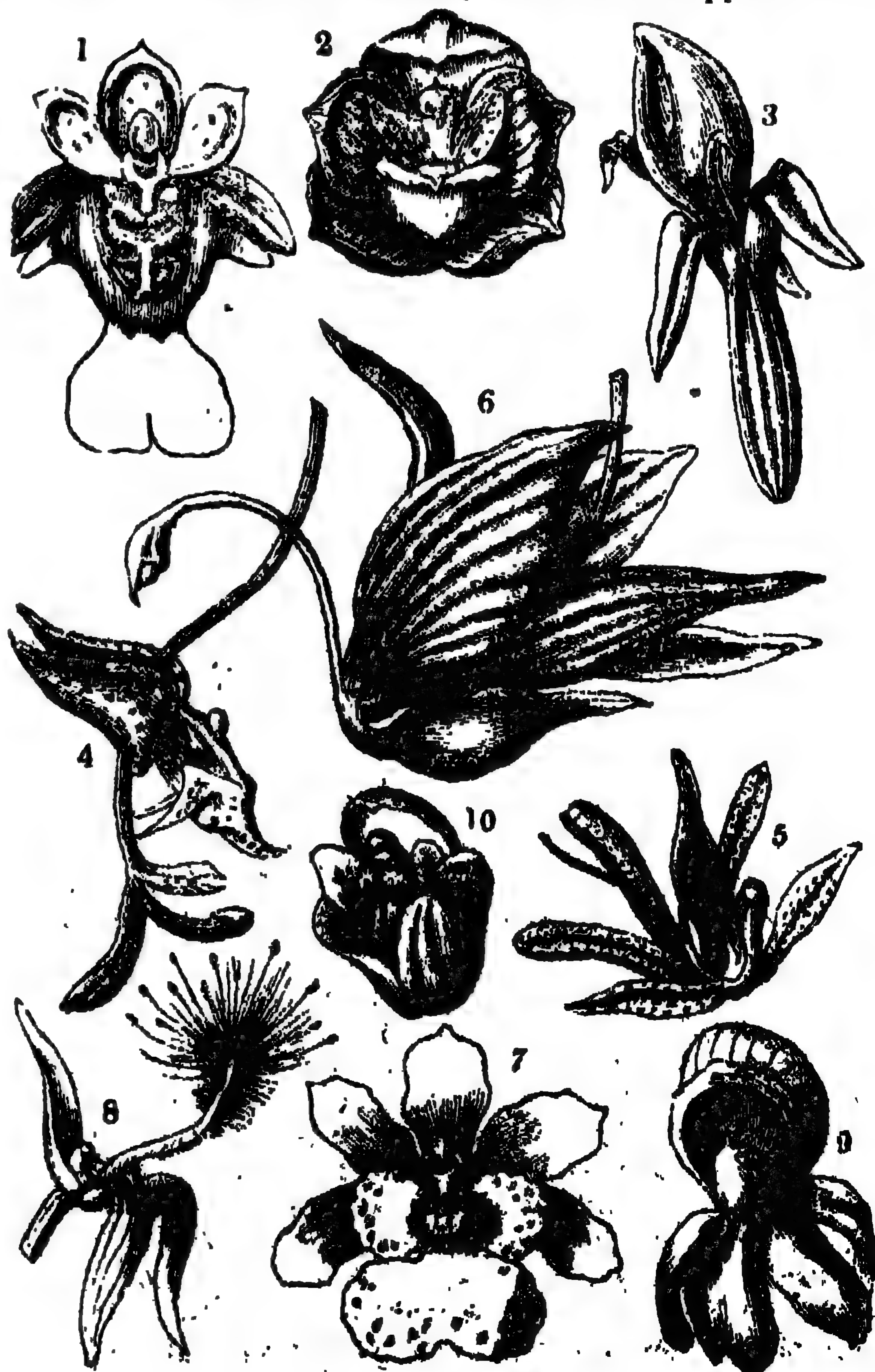
For filbert and walnut orchards see FILBERT and WALNUT. (Forsyth *On Fruit Trees*; Lindley's *Guide to the Orchard and Kitchen Garden*; *A Treatise on the Culture of the Apple and Pear*, by T. A. Knight, Esq.; Marshall's *Rural Economy of the West of England*, vol. i., p. 213; Loudon's *Arboretum*: Kenrick's *American Orchardist*.)

ORCHES'TRA (Gr. ὀρχήστρα, which contains the same element as the verb ὀρχεῖσθαι, *to dance*), that part of the Greek theatre in which the chorus was situated—where the dances were performed. With the moderns, the Orchestra is the place in the theatre allotted to the instrumental band, and that portion of a concert-room which is assigned to the musical performers, both instrumental and vocal. We not only apply the word to the place set apart for the musicians, but often use it to designate the whole of them collectively; in which case, *orchestra* and *band* are treated as synonymous terms.

Till the end of the seventeenth century, or the beginning of the last, the instrumental performers of our theatres were stationed in a box on the side of the stage, and out of view of the greater portion of the spectators. They were then few in number. But, however desirable in some respects, it would be impossible so to dispose of the large bands of the present day; and, all things considered, they could not be better placed than where they now are—just below the stage, so as not to interrupt the sight, and between the singer and the audience, thus enabling the former to have in view the conductor and leader, a matter of great importance in the musical drama, where all is sung by memory.

The Orchestra of a concert-room should be so contrived that the front, when no passage beneath it is required, is about five feet higher than the level of the room, and it should rise, rather steeply, to the back, the corners of which ought to be rounded off, in order that the whole body of sound may be directly reflected. Had this precaution been attended to in building the Hanover-square Concert-room, its orchestra would, for its size, want nothing to render it perfect. An orchestra may be too wide, which is the fault, but not an irremediable one, of Exeter Hall, in the Strand; the distance in that room from one side to the other is so great, that the various sounds do not blend with the required nicety: and, extraordinary as the fact may appear, yet, to a delicate and experienced ear, a perceptible interval of time elapses before the sound produced on one side is heard on the other.

ORCHIDA'CEÆ are Endogenous plants, with the stamens and style consolidated into a central column, and with an inferior ovary; they constitute the whole of the class *Gynandria Monandria* of the Linnean classification. There is no order of plants the structure of whose flowers is so anomalous, as regards the relation borne to each other by the parts of reproduction, or so singular in respect to the form of the floral envelopes, of which an illustration has already been given in the article ONCIDIUM. Unlike other endogenous plants, the calyx and corolla are not similar to each other in form, texture, and colour; neither have they any similitude to the changes of outline that are met with in such irregular flowers as are produced in other parts of the vegetable creation. On the contrary, by an excessive development, and singular conformation, of one of the petals, called the *labellum*, or lip, and by irregularities either of form, size, or direction of the other sepals and petals, by the peculiar adhesion of these parts to each other, and by the occasional suppression of a portion of them, flowers are produced so grotesque in form that it is no longer with the vegetable kingdom that they can be compared, but we are forced to search for resemblances in the animal world. Hence we have such names among our native plants as the bee, fly, man, lizard, and butterfly orchis, and appellations of



the like nature in foreign countries. Of these things some idea may be formed by the following cut, where 1 represents *Oncidium raniferum*, or the Frog Oncidium, so called because its lip bears at its base the figure of a frog *couchant*; 2, *Peristeria elata*, the Spirito Santo or Holy Ghost plant of Panama, in whose flower we find the likeness of a dove in the act of descending upon the lip; 3, *Prescottia colorans*, whose lip is a fleshy hood; 4, *Gongora fulva*; 5, *Cirrhæa tristis*; 6, *Cycnoches ventricosum*, singularly like a swan, the arched column forming the head and neck; 7, *Oncidium pulvinatum*; 8, *Bolbophyllum barbigerum*; 9, *Catasetum viride*; and 10, *Peristeria cerina*.

In consequence of their singular forms, their gay colours, and the delicious fragrance of many of these plants, they have of late years been cultivated with great zeal, both in this country and abroad, as has been stated in a former article [EPIPHYTES], to which we refer for information concerning their natural habits. In this place we proceed to give such a technical account of the structure of the order as will enable the reader to understand the principles of their classification, and to reconcile their structure, irregular as it is, with regular types observable in other parts of the vegetable kingdom.

Orchidaceous plants inhabit all parts of the world, except those which are excessively dry or excessively cold, both of which appear uncongenial to their nature, and they are most abundant in such as have an equable mild climate, moist and warm during the greater part of the year. Thus we have not a single species from Melville Island, or Nova Zembla, or from the upper regions of northern mountains, nor from the deserts of Africa; and the whole province of Mendoza, one of the dry western states of South America, produces but one, and that in a marsh. On the contrary, the woods of Brazil and equatorial America, of the lower ranges of the Himalayas, and of the Indian Archipelago, possess countless myriads of these productions. In general in hot countries the species are epiphytes, inhabiting the branches of trees, or the sides of rocks and stones, to which they cling by means of long twisting fleshy roots; and terrestrial species, that is to say, such as grow exclusively in the ground, are rare and unknown: in colder countries, on the contrary, the former are unknown and the latter only represent the order. Thus in North America, where Orchidaceous plants are plentiful, the epiphytal species are almost unknown, a single species only occurring in Florida upon the branches of the Magnolia. Some of them are true parasites, deriving their food from the roots of trees upon which they grow. In this country we have two cases of the kind, one the *Neottia Nidus avis*, or bird's-nest Orchis, a brownish scaly plant springing up occasionally in woods, and the other the *Corallorhiza innata*, or coral root, an occasional but very uncommon inhabitant of marshes.

The roots are of the following kinds:—Firstly, annual slender fibres, simple or branched, of a succulent nature, incapable of extension, and burrowing under ground, as in the genus Orchis. Secondly, annual fleshy tubercles, round or oblong, simple or divided, as in the various species of the same genus; they are always combined with the first, and appear, from their containing amylaceous granules in large quantity, to be intended as receptacles of matter fit for the nutrition of the plant. Tubercles of this kind have always a bud at their extremity, and may be considered the principal inferior prolongation of the axis. Thirdly, fleshy, simple, or branched perennial bodies, much entangled, tortuous, and irregular in form, as in Corallorhiza, Neottia, &c., or nearly simple and resembling tubers, as in Gastrodia. And fourthly, perennial round shoots, simple or a little branched, capable of extension, protruded from the stem into the air, adapted to adhering to other bodies, and formed of a woody and vascular axis covered with cellular tissue, of which the subcutaneous layer is often green and composed of large reticulated cells. The points of these roots are usually green, but sometimes red or yellow. In a very few instances of leafless species, as Chiloschista usneoides, they become entirely green, and then appear to perform the functions of leaves.

The stem is found in its most simple state in the terrestrial Ophrydeæ, where it is only a growing point, surrounded by scales and constituting a leaf-bud when at rest, which eventually grows into a secondary stem or branch, on which the leaves and flowers are developed. This kind of stem usually forms every year a lateral bud with a tubercular root at its lower end, and, having unfolded its flowers and ripened its fruit, perishes, to be succeeded by the stem belonging to the lateral bud previously prepared; hence those species to which this kind of stem belongs have always a pair of tubercles, one shrivelling and in progress of exhaustion, the other swelling and in progress of completion. It is sometimes found that the successive formation and destruction of annual tubercles takes place beneath an equal number of skins, the new bud and tubercular root being always formed within the axil of a scale-like coating belonging to the parent; this takes place in the genus Thelymitra and elsewhere. Sometimes such a stem, instead of forming a new bud upon its side, pushes out a slender subterranean root-like runner, which, after growing to some length, is arrested in its growth, and then forms at its extremity a new bud, which lengthens at its base into a tubercle. In such instances as this, a kind of locomotion may be correctly said to take place, the plant shifting its place yearly, and to such a distance as may be determined by the length of the runner, which separates the parent plant that perishes from the young offspring that is generated. Instances of this are common in terrestrial genera. A modification of it is when the tubercles are buried deep under ground, and always emit a root-like stem upwards, which produces true roots until it reaches the light, and then only develops leaves. This occurs in Corysanthes and elsewhere. In other cases the growing point becomes perennial, thickens, is scarred with the remains of leaves which once grew upon it, and assumes the state of a short, round, or ovate perennial stem or pseudo-bulb. In such a case it commonly emits from its base a shoot, which creeps along the ground, or over the surface of a branch, if the species is an epiphyte, and becomes a woody rhizoma, covered with scales which represent undeveloped leaves; after having advanced to a length which varies in different species, the rhizoma ceases to grow, and forms a new pseudo-bulb at its end. The latter subsequently protrudes a new horizontal rhizoma, which again terminates in a pseudo-bulb, and thus by degrees large masses of pseudo-bulbs are formed by a single individual, and literally pave the place upon which they grow. Such pseudo-bulbs are entirely analogous to the scaly bud found upon the end of the tubercular root of an Ophrydea; and the rhizoma in like manner is of the same nature as the runner that connects the old tubercle with the new one in such a plant; but pseudo-bulbs, in consequence of their perennial nature, are more completely formed, often have a woody texture, generally a hard epidermis, assume various angular or other figures, and develop a definite number of leaves from their points. This is the common mode of growth of the genera Maxillaria, Stanhopea, and many others. Pseudo-bulbs of this kind are always composed of cellular tissue, containing a great quantity of mucilage (and amylaceous granules) traversed by simple fibro-vascular cords, and hollowed into an infinite number of minute chambers. In other cases the rhizoma, instead of having pseudo-bulbs, forms short stems which are terminated by one or more leaves, as in Pleurothallis and its allies, and in the genus Cattleya and others; these differ from the pseudo-bulbous species only in the thickness and form of their axis. The formation of tubercles and terminal buds, or of creeping rhizomata and pseudo-bulbs, is the most common tendency of the order, but not the only one; in Eulophia, Bletia, and others, the rhizoma assumes simply the form of an ordinary tuber; and in Vanilla, Dendrobium, Vanda, and others of a similar nature, there is no rhizoma, but the stem lengthens as in common plants, from which there is nothing to distinguish it; some of the species of Dendrobium are remarkable for having the pseudo-bulbous form at one end of their stem, and the common state at the other, as D. crumenatum, &c. When such plants as Dendrobium Pierardi grow very fast, in an atmosphere which suits them, their stems will frequently branch, when the new branches throw out roots in abundance from their base; in such cases the original branches are equivalent to the rhizoma of the pseudo-bulbous species, and the secondary branches to the pseudo-bulbs themselves.

The leaves are very uncertain in their appearance: usually they are sheathing at the base, and membranous; but in Vanilleæ they are hard, stalked, articulated with the stem, and have no trace of a sheath. Frequently they are leathery and veinless, as frequently they are membranous and strongly ribbed, and both these conditions occur in the same genus, as in Maxillaria and Cypripedium. In a large number of the epiphytal species the leaves are notched un

equally at the apex, a singular structure which has not yet been noticed in those with membranous leaves.

Their floral envelopes are constructed irregularly upon a ternary type, and consist of three exterior and three interior pieces. The exterior pieces are usually nearly equal, and less brightly coloured than the interior; but the two lateral ones are often of a somewhat different form from the other, which is anterior as the flower is placed upon the inflorescence when young, but which often becomes posterior when the flower is expanded, in consequence of the flower-stalk being twisted or curved: these parts are occasionally united by their edges into a long tube, as in Masdevallia, or the lateral ones adhere to the unguis of the lip in various degrees, or two of them are consolidated into one, as in Corycium and many other genera. Occasionally the intermediate piece is prolonged at the back or base into one or two hollow spurs, as in the genera Satyrium and Disa; still more rarely the lateral pieces are also spurred, as in Disperis. Various other less important modifications of the exterior pieces occur, but in all cases the whole number, three, is present. The interior pieces are usually three, never more; but in the instances of Monomeria and Aviceps, the intermediate one only is present. They are generally unequal, the two lateral pieces corresponding in form and size, while that between them, called the lip, is of some other form and size: in the genus Thelymitra however, and in Paxtonia, they are all alike. Nothing can be more variable than the proportions they bear to each other and to the exterior pieces. It is only a few of their modifications which it seems important to notice. The lateral pieces are occasionally bifid, as in certain species of Habenaria: in Megaclinium falcatum they are glandular at the apex: in most cases they are distinct from the column; but in Lepanthes, Gongora, Disa, and some others, they are adnate to that organ: in no instance are they spurred or saccate. The lip is either distinct from the column or united to it, stalked at its base, or dilated there, and often extended into a bag or spur, which is sometimes, as in certain species of the genus Epidendrum, consolidated with the ovary: very rarely it has two spurs, as in Diplocentrum. In the instances of Camarotis and Acropera it is saccate at the point. Its form is infinitely varied, the extremes of variation being Paxtonia for simplicity, and Coryanthes or Stanhopea for complexity: these and all other complicated forms may, without difficulty, be reduced to a three-lobed type, the simple form of which is found in Maxillaria, *Bletia*, and many Cattleyas. The lip is often so slightly articulated with the column as to swing to and fro upon the least disturbance, on which account it sometimes seems as if it were endowed with a power of spontaneous motion: this is particularly apparent in certain species of Pterostylis. There is a frequent tendency in the lip to produce tubercles or lamellæ upon its surface; the latter are always confined to the veins, the former are principally found near the base of the lip, and do not appear to have any relation to the veins: it is in the genus Oncidium, Eria, and Zygopetalum that these bodies, the use of which is unknown, are most conspicuous. Not unfrequently the lip is hairy, convex, and so marked and coloured as to bear no little resemblance to an insect.

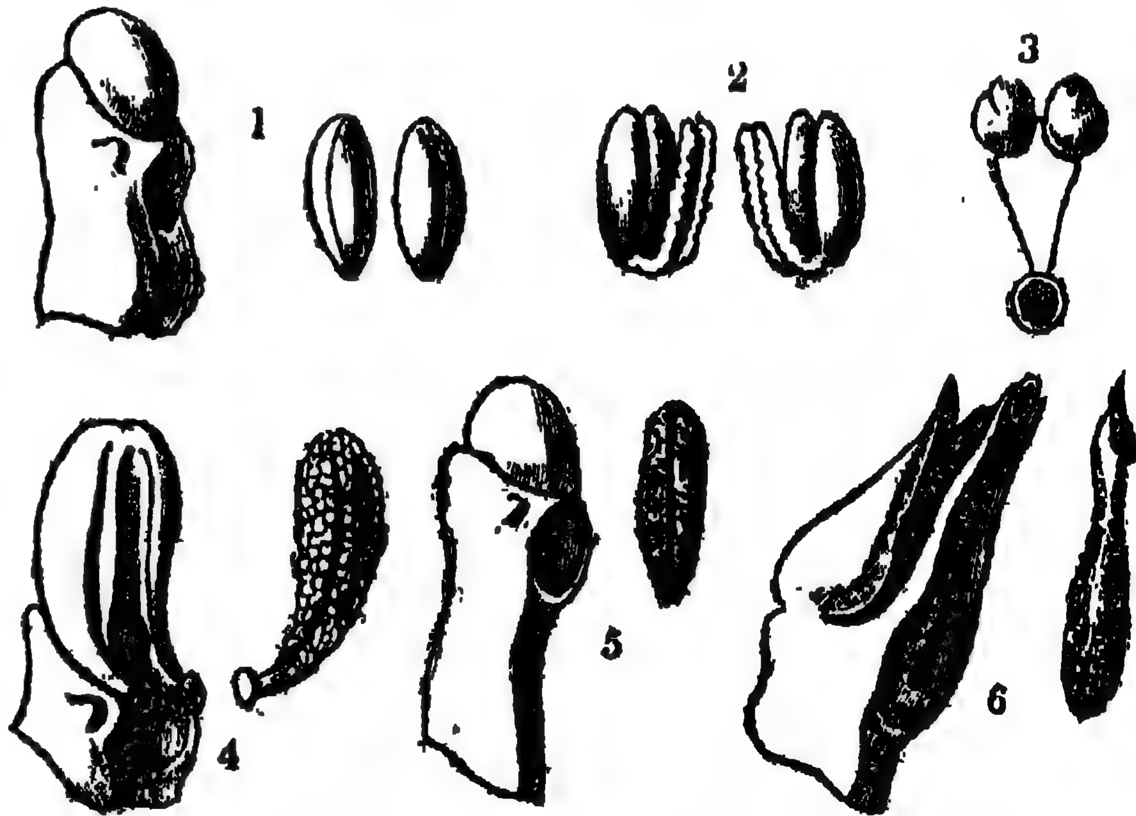
It is usual to call the exterior series of floral envelopes calyx, and the interior corolla; but the analogy of Marantaceæ renders it probable that the so-called petals are a row of outer sterile stamens. This however is a point upon which it is not here necessary to enlarge.

The centre of the flower is occupied by a body called the column, which is formed by the consolidation of the style and true stamens. In the greater part of the order there is but one stamen present, and it is in that case placed opposite the intermediate sepal, and consequently alternate with the lateral petals; when, as in Cypripedium, there are two stamens present, then the usual stamen remains in its customary position, in a sterile state; and the two perfect stamens are additional, and placed right and left of it. It is supposed that in those species which have but one anther there are two other stamens present in an incomplete condition, and consolidated with the other; and from the evidence offered by monstrous formations, it is thought that such sterile stamens are represented in Orchis and its allies by two tubercles, one on each side of the column; in Burlingtonia by two auricles near the apex of the column, and by other signs in other cases. Some objections have however been taken to this, but they do not appear of sufficient moment to require particular discussion. The reader who is anxious for information as to this and several other points of a similar kind, is referred to the prefatory remarks by the writer of this article in Bauer's 'Illustrations of Orchidaceous Plants,' 4to., London, 1830, 1838, with forty plates, in 4to.

In the greater part of the order a single anther terminates the column. This is usually two-celled, but often has its cells divided into two or four other cavities, by the extension of the endothecium between the lobes of the pollen masses, or is occasionally more or less completely one-celled by the absorption of the connective. In Ophrydeæ it is erect, with a distinct connective, and with the bases of the cells either parallel or diverging, and then its cells dehisce along their face. In Neottieæ it is also erect, but appears to be dorsal instead of terminal, in consequence of the stigma being placed before it for its whole length. In the remainder of the order it falls prone upon the head of the column, or the clinandrium, like a lid, and often is easily detached: sometimes this kind of anther originates from the margin of the clinandrium; sometimes from within the margin, in which case it is occasionally covered as by a hood, as in Cryptarrhena and other genera.

The pollen consists of lenticular or spheroidal grains, either single or cohering in pairs, threes, or fours, or in larger masses in indefinite number. The grains are usually held together by an elastic filamentous substance, which in all Ophrydeæ and many others forms an axis round which the grains or masses of grains are arranged, and which in a very large part of the order assumes the appearance of a strap or caudicula. This body either contracts an adhesion with a gland originating on the margin of the stigma, as in Ophrydeæ, Neottieæ, and Vandeæ, or it is folded upon the pollen masses, as in Epidendreæ, or it terminates in an amorphous dilatation, as in many Malaxideæ. In all cases it consists of cellular tissue, sometimes very lax and large, and thin-sided, as in Polystachya ramulosa, more generally very compact, tough, and thick-sided; towards the end which adheres to the stigmatic gland the tissue becomes elongated, but otherwise it is more or less lenticular. In Ophrydeæ the caudicula is extended towards the base of the anther-cells; but in all the other divisions of the order the caudicula, when present, is lengthened in the direction of the apex of the cells.

The differences in the structure of the column, anther, and pollen now explained, furnish botanists with the best means of classifying the order and of breaking it up into suborders, in the following manner:—



1. *Malaxideæ* (*fig.* 1), anther opercular; pollen waxy, with neither caudicula nor gland.
2. *Epidendreæ* (*fig.* 2), anther opercular; pollen waxy, with the caudicula folded back upon the pollen grains, and no gland.
3. *Vandeæ* (*fig.* 3), anther opercular; pollen waxy, with a membrano-cartilaginous caudicula and gland.
4. *Ophrydeæ* (*fig.* 4), anther erect; pollen sectile or granular.
5. *Arethuseæ* (*fig.* 5), anther opercular; pollen granular or powdery.
6. *Neottieæ* (*fig.* 6), anther dorsal; pollen powdery.
7. *Cypripedieæ*, anthers two, separated by a broad sterile lobe.

The ovary adheres firmly to the tube of the calyx, and is often so twisted, when the flower is about to expand, that its back, with the floral envelopes belonging to it, is turned to the front. It consists of three perfect carpels, stationed alternately with the stamens opposite the petals, and bearing the placentæ in their axis, and of three other pieces alternate with the first, destitute of placentæ, and eventually separating from them when the fruit is ripe.

The stigma is a viscid excavation in front of the anther,

and just below it. In most cases it is quite simple, merely terminating in a glandular dilatation of the upper margin, called the rostellum. It is lined with a lax tissue composed of minute ascending jointed hairs, and has a direct communication with the cavity of the ovary, either open or only imperfectly closed up. The glandular dilatation in all Vandeæ and Ophrydeæ, and in many genera, separates from the stigma and adheres to the pollen masses, but it is also in numerous other genera at all times inseparable from it. In Bonatea, in Habenaria, and in some other genera of Ophrydeæ, there are two arms to the upper edge of the stigma, each arm being channelled for the reception of the caudicula of a pollen-mass, and terminating in a separable gland; between these lies a membrane, very variable in size, sometimes merely a connecting web, sometimes a distinct plicature or lobe, and occasionally fornicate and extended in the middle into a mucro.

The fruit is usually a capsule of six valves, bursting when ripe; and discharging a multitude of minute seeds, with a netted loose tunic. In Vanilla however and some other genera the fruit is succulent, and the seeds have a hard brittle integument immersed in aromatic pulp. The seeds apparently contain an exalbuminous embryo; but from the great minuteness of the parts this point is not yet satisfactorily determined.

Impregnation in Orchidaceæ was at one time thought to take place in a peculiar manner, by intersusception of the fertilising principle of the pollen grains. It has now however been proved experimentally by Brown, A. Brongniart, Morren, and the writer of this article, that it in reality takes place only by the application of pollen grains to the mucous surface of the stigma, as in other plants.

Those who are desirous of further acquaintance with this singular order should consult Bauer's *Illustrations*, above quoted; R. Brown's *Prodromus Floræ N. Hollandiæ*, 8vo., 1810; the same author's *Observations upon the Impregnation of Orchideæ and Asclepiadeæ*, 8vo., London, 1831; Lindley's *Genera and Species of Orchidaceous Plants*, 8vo., London 1830-40, still in course of publication; and Endlicher's *Genera Plantarum*, p. 185, 4to., Vienna, 1836-40, still publishing.

ORCHIL, or ORCHELLA, also written *Archil*, is the name of a dye as well as of the plant (one of the humble tribe of Lichens, or Rock-Moss) which yields it. The name is derived from the *Oricello* of the Italians, or the Spanish *Orchella*. It is often corrupted in commerce into Rochilla weed. Several kinds are employed for the same purpose, which are distinguished according to the country from whence they are imported, and also by manufacturers into *weed* and *moss*, the former name being applied to the filiform lichens of botanists belonging to the genus Roccella, to be treated of here, while the terms *moss* and *rock-moss* are applied to the crustaceous lichens belonging to the genus Lecanora, which include the Cudbear and Parelle of dyers. [PARELLA.] Tournefort is of opinion that this dye was known to the antients, and that it was the λειχην of Dioscorides; this of course it is difficult to prove, but it is remarkable that the Arabian authors give *abryon* (an βρυον?) as the Greek synonym of a lichen which is in India used as a dye. Tournefort further thought that this was the substance used in dyeing the *purple of Amorgos*, one of the Cyclades, and says that when he was in the island, the lichen was still collected, and sold for ten crowns the hundredweight, to be sent to England.

The mode of preparing the dye was however lost, until rediscovered by a Florentine, who realised a large fortune, and kept the process secret. The manufacture was retained for a century in Italy, and the weed was collected on the shores of the Mediterranean and those of its islands. It was however called tincture of *turnsole*. The Dutch afterwards carried on the manufacture, and called it lacmus or litmus; but it has for some time been extensively carried on in England and Scotland, as is evident from 1813 cwts. having been imported in 1829, though the quantities of good kinds have since diminished, from the difficulty of procuring them, as the price has continued to rise, and many parts of the world have been searched for species fit for the use of the dyer. That imported from the Canaries sells for 250*l.* to 350*l.* a ton; Cape de Verde weed, as high as 300*l.*; the Azores or Western Island weed, 230*l.*; Madeira, 150*l.*; Africa, 120*l.*; South America, 120*l.*; Cape of Good Hope, 20*l.*; while some has recently been brought from the East Indies, where both kinds are found, and one of them very abundantly.

This great difference of price is owing to different kinds being collected; some kinds, as the Canary weed, *Roccella tinctoria*, abound in colour; while others, as the *R. fuciformis*, contain it in much smaller proportion. These species resemble each other a good deal, and therefore the difficulty is great of collecting the good kind. Sir W. J. Hooker has given as the character of the genus Roccella,—Thallus coriaceo-cartilaginous, rounded or plane, branched or lacineated; apothecia orbicular, adnate with the thallus; the disk coloured, plano-convex, with a border at length thickened and elevated, formed of the thallus, and covering a sublentiform, black, compact, pulverulent powder, concealed within the substance of the thallus.

R. tinctoria (Dyers' Roccella, or Orchil): thallus suffruticose, *rounded*, branched, somewhat erect, greyish-brown, bearing powdery warts; apothecia flat and horny, with a scarcely prominent border. A practical writer describes 'the good kind as having a nearly white powder on its surface towards the centre; the under surface is of a grey colour, and is not hairy; if wetted, it does not turn of an orange colour; its edges are flat and thin.'

R. fuciformis (flat-leaved Orchil): thallus *flat*, branched, nearly upright, greyish-white, bearing powdery warts; apothecia horny, bordered.

Both kinds are found on maritime rocks, as well on the coast of England as those of the places already indicated, or on dry stone walls, exposed to the influence of the sea-breeze; the more arid the situation, the better is the quality of the lichens. The presence of the colouring matter is ascertained by steeping the weed broken up in small pieces in diluted solution of ammonia, in a bottle half filled with liquid, which should be kept corked, but frequently opened in a temperature not exceeding 150° Fahr. Orchil forms a rich purple dye, which, though fugitive, is considered indispensable by the dyers, because it greatly improves the brilliancy of some of the colours, and gives the peculiar lustre and purple tint to some of the English broad-cloths in consequence of their being first dyed with orchil. [ARCHIL.] ('Proceed. Com. Asiatic Soc.,' April, 1837; also Thomson's 'Chemistry of Organic Bodies—Vegetables,' where a full account is given of several chemical analyses of dye-yielding lichens, p. 399.)



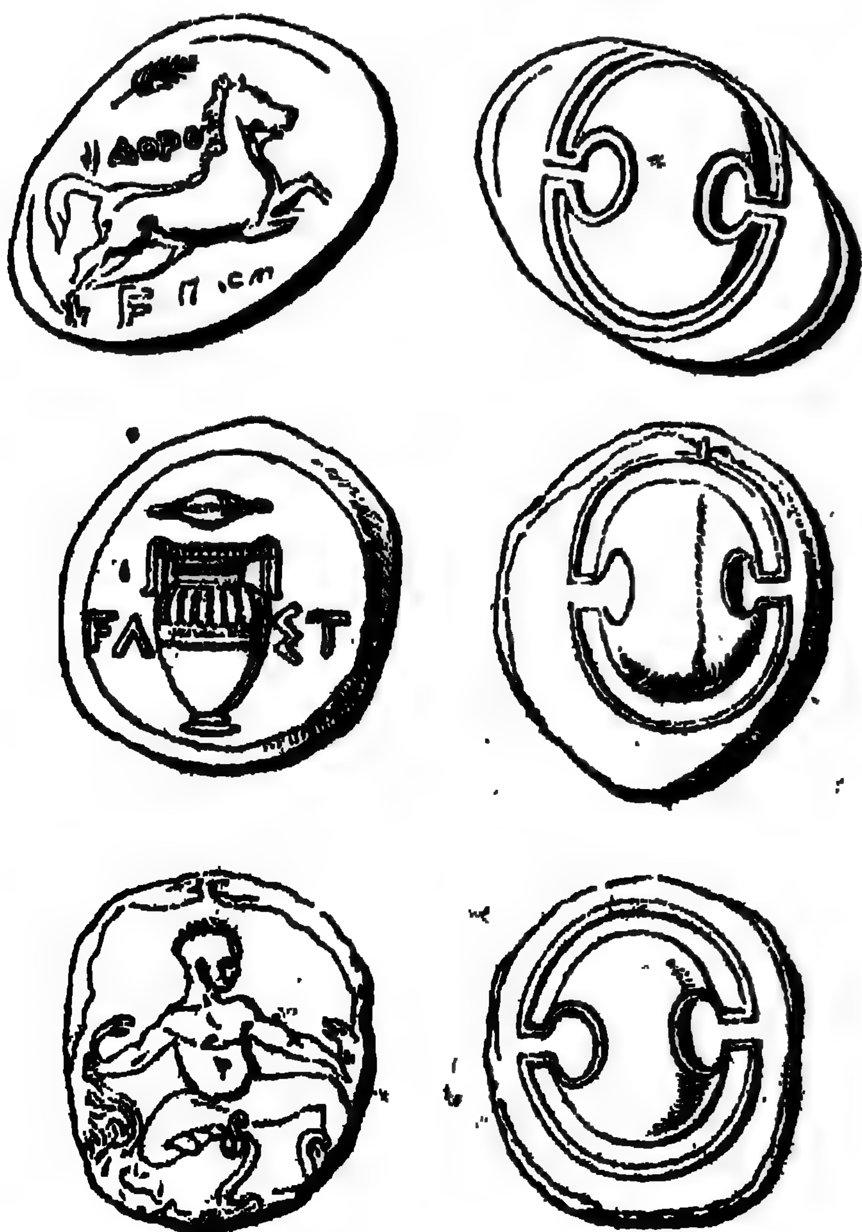
1, Roccella tinctoria; *a*, warts on the thallus.
2, Roccella tinctoria (East India).
3, Roccella fuciformis; *b*, apothecia.

ORCHO'MENUS, called the 'Minyean,' and afterwards 'the Bœotian,' was a city on the western shore of the Lake Copais, in Bœotia. In the earliest period of Grecian history it was known as a place of great power and wealth. (Homer, *Iliad*, ix. 381.) Its antient magnificence is attested by the treasury of Minyas in it, which is described by Pausanias as being equal to any similar building which he had seen, and by the subterranean outlets of the Lake Copais, the remains of which exist to this day. [Bœotia, vol. v., p. 43.] In the earliest times Orchomenus was the chief city of the Minyans, to whom the greater part of Bœotia, including Thebes itself, was subject. The history of this people is very obscure. Andreus, the first king of Orchomenus, is called the son of the river Peneus in Thessaly. In Thessaly moreover we find Minyans, with a city Orchomenus. Minyas is also made a descendant of Æolus. Mr. Thirlwall says that the early legends about the Minyans 'may be considered as indications of a native race, apparently Pelasgians, overpowered by Æolian invaders; and the same fact seems still more clearly attested by the names of the two Orchomenian tribes, the Eteoclean and the Cephisian; the former of which, called after Eteocles, the son of Andreus, seems to have comprised the warlike chiefs; the latter, the industrious people which tilled the plains watered by the Cephisus.' (*History of Greece*, vol. i., p. 93.) From the heroes of the Argonautic expedition being called Minyans, and from other circumstances, it has been thought that the name was not originally that of a nation, but was used as a title of honour equivalent to heroes or warriors, and was afterwards appropriated to the Æolians who established themselves at Iolcus and on the adjacent coast. (*Ibid.*, p. 91.) In the sixtieth year after the Trojan war, the Æolian Bœotians, who had been expelled from Thessaly, drove out the Minyans from Orchomenus, which was then with its territory added to Bœotia. (Thucyd., i. 12; Strabo, ix., p. 401.)

At and shortly before the time of the Peloponnesian war, we find Orchomenus as one of the most powerful states of the Bœotian confederacy, and having under it the towns of Chæronea and Tegyra. Its government was oligarchical: the ruling order was called 'knights.' (Diod. Sic., xv. 79.) When Thebes was feeble, and Bœotia was subject to Athens (about B.C. 417), Orchomenus was a refuge for the oligarchical exiles of the neighbourhood. (Thucyd., i. 113.) After the peace of Antalcidas (B.C. 387), by which the Bœotian cities were freed from the supremacy of Thebes, Orchomenus was confederate with Sparta, and had in it a Lacedæmonian garrison. (Plutarch, *Pelop.*, 16.) In the year 368 B.C., the Thebans, taking advantage of the absence of Epaminondas on an expedition, destroyed Orchomenus, slaying the men, and selling the women and children into slavery. It was rebuilt after the destruction of Thebes, and is mentioned by Dicæarchus about twenty years after the death of Alexander.

The worship most prevalent in Orchomenus was that of the three Graces (χαριτήσια): there was also a temple of Dionysus in the city, and shrines of the heroes Actæon and Minyas, with which games (Μινύεια) were connected (Schol. to Pind., *Isth.*, i. 11), and a tomb of Hesiod, at which offerings were made. In the Orchomenian town of Tegyra there was a temple and oracle of Apollo. (Steph. Byz., Τέγυρα.)

(Müller's *Orchomenos und die Minyer*; Wachsmuth's *Hellenische Alterthumskunde*; Clinton's *Fasti Hellenici*, Thirlwall's *History of Greece*.)



Coins of Bœotia.
British Museum. Actual Size.

ORCHO'MENUS, Arcadia. [Arcadia.]

ORCIN, a peculiar matter obtained by Robiquet from a species of lichen (*variolaria orcina*). He found that the colour of this substance is derived from the presence of a body which is white until it is acted upon by the air and alkalis, when it becomes reddish violet. The process of preparing orcin consists in making an alcoholic solution of the lichen, and then treating it with water, which separates a fatty colouring matter, and dissolves a bitter and saccharine substance; this, after several solutions and evaporations, is obtained in white crystals. These crystals are orcin, which become, as already stated, of a reddish violet colour by the action of the air and alkalis.

ORDEAL, from the Anglo-Saxon *ordæl*. Spelman derives this word from *or*, 'magnum,' and *dæl*, 'judicium;' which is also the derivation given by Ducange. Lye and Bosworth derive it from *or*, privative, 'without,' and *dæl*, 'difference,' an indifferent or impartial judgment, a judgment without distinction of persons. The German word *urtheil*, a judgment, is apparently the same word, and is also a compound. (See Selden, *Notes to Eadmer*, and Hickes's *Diss. Epist.*, p. 149.)

The earliest traces of any custom resembling the ordeal is found in the book of Numbers (ch. v.), in the waters of jealousy, which the Hebrew women suspected of adultery were compelled to drink as a test of their innocence.

Blackstone (*Comm. on the Laws of England*, vol. iv., ch. 27, 'Of Trial and Conviction') says:—'The several methods of trial and conviction of offenders established by the laws of England were formerly more numerous than at present, through the superstition of our Saxon ancestors, who, like other northern nations, were extremely addicted to divination, a character which Tacitus observes of the antient Germans (*De Mor. Germ.*, x.). They therefore invented a considerable number of methods of purgation, or trial, to preserve innocence from the danger of false witnesses; and in consequence of a notion that God would always interpose miraculously to vindicate the guiltless. The most antient species of trial was that by *Ordeal*; which was peculiarly distinguished by the appellation of *Judicium Dei*, and sometimes *vulgaris purgatio*, to distinguish it from the canonical purgation, which was by the oath of the party. This was of two sorts, either fire-ordeal or water-ordeal, the former being confined to persons of higher rank, the latter to the common people. Both these might be performed by deputy; but the principal was to answer for the success of the trial, the deputy only venturing some corporal pain for hire, or perhaps for friendship. Fire-ordeal was performed either by taking up in the hand, unhurt, a piece of red-hot iron, of one, two, or three pounds weight; or else by walking, barefoot and blindfold, over nine red-hot ploughshares, laid lengthwise at unequal distances; and if the party escaped being hurt, he was adjudged innocent; but if it happened otherwise, as without collusion it usually did, he was then condemned as guilty. However, by this latter method Queen Emma, the mother of Edward the Confessor, is mentioned to have cleared her character when suspected of familiarity with Alwyn bishop of Winchester. (Rudborne, *Hist. maj. Winton*, l. 4, ch. i.) Water-ordeal was performed either by plunging the bare arm up to the elbow in boiling water, and escaping unhurt thereby; or by casting the person suspected into a river or pond of cold water, and if he floated therein without any action of swimming, it was deemed an evidence of his guilt, but if he sunk, he was acquitted.' Another species of ordeal was the corsned, or morsel of execration: this was a piece of cheese or bread, about an ounce in weight, which was consecrated with a peculiar form, in which the Almighty was called upon, and it was prayed that the bread might cause convulsions and paleness, and find no passage, if the man was really guilty, but might turn to health and

nourishment, if he was innocent. The corsned was then given to the suspected person, who received the holy sacrament at the same time: if indeed, as some have suspected, the corsned was not the sacramental bread itself. It is said that Godwin, earl of Kent, in the reign of king Edward the Confessor, on taking his oath that he had not caused the death of the king's brother, appealed to his corsned, 'per buccellam deglutiendam abjuravit' (Ingulphus), which stuck in his throat and killed him.

The Ordeals of water and iron are first mentioned in the 77th law of Ina. (Wilkins, *Leg. Anglo-Sax.*, p. 27.) See also the laws of Athelstan, Edward the Confessor, and the Conqueror. (*Ibid.*, pp. 60, 198, 229.)

In the 'Domesday Survey' the readiness of claimants to prove their title to land, by ordeal or by battle, occurs in a great variety of instances; as among the lands belonging to the monastery of Ely, at a place then called Photestorp, in Norfolk: 'Hanc terram calumpniatur esse liberam Vlchetel homo Hermeri quocunque modo judicetur, vel bello vel *Juditio.*' (*Domesd.*, tom. ii., fol. 213. See other instances, *Ibid.*, fol. 110 b, 137, 162, 166, 172 b, 193, 208, 277 b, 332.) 'Ferri candentis Judicium' (the ordeal of hot iron) is the only ordeal of the 'Domesday Survey.' The reason for this is given by Glanville (*Tract. de Leg. et Consuet. Regni Angliæ*, l. xiv., ch. 1): 'in such a case the accused is bound to clear himself by the judgment of God, namely, by hot iron, or by water, according to the difference of rank, that is, by hot iron if he should be a free man, and by water if he should be a villain (si fuerit rusticus).'

Eadmer (*Hist. Novor.*, p. 48) speaks of no fewer than fifty persons of Saxon origin who, in the reign of William Rufus, being accused of killing the king's stags, were at one time sentenced to the fire-ordeal.

It is probable that the Trial by Ordeal was not discontinued in England by any positive law or ordinance, although Sir E. Coke (9 *Rep.*, 32), and after him Blackstone (4 *Comm.*, 345), have expressed an opinion that it was finally abolished by an act of parliament, or rather an order of the king in council, in the 3 Henry III. (1219). This order is to be found in Rymer's 'Fœdera,' vol. i., p. 228; Spelman's 'Glossary,' sub voce *Judicium Dei;* and in Selden's 'Notes to Eadmer.' Spelman however thinks that this was merely a temporary law, without any general or permanent operation, and that the Trial by Ordeal continued to a later period. This opinion seems confirmed by a reference in the 'Cal. Rot. Pat.,' p. 15, to another order in council in the 14 Henry III., 'De justitiâ faciendâ loco ignis et aquæ.' As however it is only mentioned as a former custom, and not as an existing institution, by Bracton (lib. iii., cap. 16), who wrote at the end of the reign of Henry III. or the commencement of that of Edward I., it is probable that, in consequence of the judgments of councils and the interference of the clergy, the Trial by Ordeal fell into disuse about the middle of the thirteenth century (Selden's *Notes to Eadmer*); but this was long after it had disappeared from the judicial systems of most other European nations.

Blackstone, in the part of his 'Commentaries' already quoted, says, 'Purgation by ordeal seems to have been very antient, and very universal in the times of superstitious barbarity. It was known to the antient Greeks: for in the 'Antigone' of Sophocles (v. 270) a person, suspected by Creon of a misdemeanor, declares himself ready "to handle hot iron, and to walk over fire," in order to manifest his innocence; which the scholiast tells us was then a very usual purgation.' And Grotius (on *Numb.* v. 17) gives us many instances of water-ordeal in Bithynia, Sardinia, and other places.

'In Siam, besides the usual methods of fire and water ordeal, both parties are sometimes exposed to the fury of a tiger let loose for that purpose: and if the beast spares either, that person is accounted innocent; if neither, both are held to be guilty; but if he spares both, the trial is incomplete, and they proceed to a more certain criterion.' (*Mod. Univ. Hist.*, vol. vii., p. 266.)

The '*Asiatic Researches*' (vol. i., 4to. Calcutta, 1788, p. 389-404) contain a memoir on the trials by ordeal among the Hindus, by Ali Ibrahim Khán, chief magistrate at Benares, communicated by Warren Hastings, Esq., nine in number: 1, by the balance; 2, by fire; 3, by water; 4, by two sorts of poison; 5, by Cosha, in which the accused drinks of water in which the images of the sun and other deities have been washed; 6, by chewing rice; 7, by hot oil; 8, by hot iron; 9, by Dharmach, in which an image named Dharma, or the genius of justice, made of silver, and another of an antagonist genius Adharma, made of clay or iron, or those figures painted respectively on white and black cloth, are thrown into a large jar, from which the accused is instructed to draw at hazard.

The Latin forms of service for the different species of ordeal, as antiently used in England, are given by Spelman in his 'Glossary,' in *v.* from the Textus Roffensis.

The reader may consult for further information Grimm's *Deutsche Rechts-Alterthümer, Gottesurtheil.*

ORDER is distinguished from *degree* in mathematical language by a purely conventional boundary. Both are terms of succession; thus an expression is of the first, second, third, &c. degree, according as its highest power is the first, second, third, &c. of the principal letter. But if another succession should occur, say one of differentiations, then the number of such successive operations is the order of the process. Thus a differential equation which contains, at the highest, the fifth power of a differential co-efficient, is said to be of the fifth degree; while if the highest differential co-efficient which occurs in it is the third, it is said to be of the third *order*.

There is a particular use of the word *order* in regard to quantities which increase or diminish without limit. If A and B both diminish without limit, but if A diminish without limit with respect to B [INFINITE], A is said to be of an inferior order to B; and generally the first powers of small quantities are said to be of the first order; products of two small quantities, and second powers, of the second order; and so on.

ORDERS, HOLY. [ORDINATION.]

ORDERS OF ARCHITECTURE. [CIVIL ARCHITECTURE; COLUMN.]

ORDERS OF KNIGHTHOOD. [KNIGHTHOOD.]

ORDINARY. This term, when used in English law, commonly signifies the bishop of the diocese, who is in general, and of common right, the ordinary judge in ecclesiastical causes arising within his jurisdiction. (Lindwoode's *Provinciale*, lib. i., tit. 3). The term is also applied to the commissary or official of the bishop, and to other persons having, by custom or peculiar privilege, judicial power annexed to their offices or dignities. Thus an archdeacon is an ordinary. A bishop therefore is always an ordinary, but every ordinary is not a bishop.

The term is derived from the Canonists, and is in common use in several European countries. Since the Lateran council, when the apostolic see assumed the power of presenting to benefices, the pope has sometimes been called by canonical writers 'ordinarius ordinariorum.' In England the probate of wills, the granting of letters of administration, the admission, institution, and induction of parsons, and several other authorities of a judicial nature, are vested in the ordinary. The judex ordinarius of the canon and of the later Roman law is a judge who has judicial cognizance in his own proper right, as such judge, of all causes arising within the territorial limits of his jurisdiction. He is opposed to the judex delegatus, or extraordinarius, whose jurisdiction extends only to such causes as are specifically delegated to him by some superior authority. (Ayliffe's *Parergon*, p. 309; Justin., *Novell.*, 20, c. 3, and 112, c. 31.) With reference to this distinction, it became usual to apply the term 'ordinary' to bishops, who, when acting in their judicial character in ecclesiastical causes, have strictly an ordinary jurisdiction; and we find it used in this sense by Bracton and the earliest writers upon English law.

ORDINATE is that particular rectangular Co-ordinate of a curve which is measured perpendicularly to one of the axes and not upon an axis. [CO-ORDINATE.] It is necessary to observe that though the term co-ordinate has been extended to what are called polar co-ordinates, yet the word ordinate is not separately used in the latter system. The etymology of ordinate will be found in the article cited.

ORDINATION, the ceremony by which holy orders are conferred, or by which a person is initiated into the ministry of religion, or set apart for preaching, administering the sacraments, and discharging other ecclesiastical rites and duties, public or private. In the Church of England, a candidate must be twenty-three years of age before he can be ordained deacon, and twenty-four before he can be ordained priest; must have an appointment to some cure, except he be a fellow of a college; bring letters testimonial of his life and doctrine, for three years, from three beneficed clergymen; undergo an examination in Latin, Greek, and

theological learning; subscribe to the Thirty-nine Articles and the Liturgy; and, as bishops now almost invariably require, have graduated at one of the English universities, at Trinity College, Dublin, or at some other recognised school. No person can hold any vicarage, rectory, or benefice whatever, except he be in full orders.

A form of some kind has always been observed in conferring the priesthood. This was the case under the Old Testament dispensation; in which the family, age, and qualifications of the individual appointed, are particularly described. In the New Testament, our Lord called the twelve apostles, and sent them out—ordained them to perform the offices of religion. So likewise the apostles ordained others; and the form they adopted for setting them apart was *prayer* and the *imposition of hands*. In this manner bishops, priests, and deacons were appointed; and, for at least ten centuries, no other ceremony was used or added thereto. When the church became corrupt, this, like almost every other ordinance, shared the general perversion. It lost its primitive simplicity, and was elevated to the dignity of a sacrament. The plan was adopted of delivering to a person ordained priest the *sacred vessels, i.e.* the plate and the cup; employing with the action certain words by which he was authorised to offer sacrifice to God, and to celebrate mass. To constitute a sacrament, three things are required, *matter, form*, and *institution*. Ordination was evidently instituted by Jesus Christ and his apostles; but in their institution of it, it clearly wants the main essentials of a sacrament. The church of the eleventh century, in converting it into a sacrament, considered the *vessels* as the *matter*, and the *form* was the delivering them with the words:—'Take thou authority to offer up sacrifices to God, and to celebrate masses, both for the living and the dead; in the name of the Father, the Son, and the Holy Ghost.' Protestant churches have returned to the original method of conferring orders, and use only prayer and the imposition of hands; some sects dispense with the latter, as the Wesleyan Methodists.

The great controversy between Episcopalians and Presbyterians is, the authority by which holy orders are conferred. The former hold that bishops alone are vested with this authority; and those especially who entertain the notion of *Apostolic succession, i.e.* assert the fact of an unbroken episcopal series from the days of the Apostles to the present time, to which the power of ordaining ministers is confined and through which it descends, deny the validity of orders and even the existence of a church, where there is no bishop. The Presbyterians, on the contrary, contend that the presbytery, or a body of priests, have authority for this purpose; and that bishops and presbyters are in Scripture the same, and not distinct orders or officers. They urge that Timothy was ordained by the laying on of the hands of the presbytery; and that Paul and Barnabas were ordained by certain teachers and prophets in the church of Antioch, and not by any bishop presiding in that city. It is certain however that bishops have existed as a distinct order from the very earliest times; and though we cannot assert that they are absolutely essential, yet they evidently contribute to complete the idea of a church, and tend to its orderly and effectual operation.

Many at the Reformation held the call of the people the only thing essential to the validity of the ministry, and taught that ordination is only a ceremony which renders the call more solemn and authentic. Accordingly the Protestant churches of Scotland, France, Holand, Switzerland, &c., have no episcopal ordination. For Luther, Calvin, Bucer, Melancthon, and all the first reformers and founders of these churches, who ordained ministers among them, were themselves presbyters and no other. The following remarks on this subject appear at once liberal and judicious. They are from Burnett's 'Exposition of the Thirty-nine Articles;' himself an English bishop, and attached to the Episcopal form of church government. 'If a company of Christians find the public worship where they live to be so defiled that they cannot with a good conscience join in it, and if they do not know of any place to which they can conveniently go, where they may worship God purely, and in a regular way; if, I say, such a body, finding some that have been ordained, though to the lower functions, should submit itself entirely to their conduct; or finding none of those, should by a common consent desire some of their own number to minister to them in holy things, and should upon that beginning grow up to a regulated constitution; though we are very sure that this is quite out of all rule, and could not be done without a very great sin, unless the necessity were great and apparent; yet if the necessity is real and not feigned, this is not condemned or anulled by the article (the 23rd); for when this grows to a constitution, and when it was begun by the consent of a body, who are supposed to have an authority in such an extraordinary case, whatever some hotter spirits have thought of this since that time, yet we are very sure that not only those who penned the Articles, but the body of this church for above half an age after, did, notwithstanding these irregularities, acknowledge the foreign churches so constituted to be true churches as to all the essentials of a church, though they had been at first irregularly formed, and continued still to be in an imperfect state.' And again:—'Whenever God by his providence brings Christians under a visible necessity of being either without all order and joint worship, or of joining in an unlawful and defiled worship, or finally, of breaking through rules and methods in order to the being united in worship and government; of these three, of which one must be chosen, the *last* is the *least* evil, and has the fewest inconveniences hanging upon it, and therefore it may be chosen.' (Burnett *On the Articles;* Watson's *Theological Dictionary*.)

ORDNANCE, a general term applied to the great artillery (guns, carronades, howitzers, and mortars) which is used in war, on land or at sea; the name being probably derived from the *compagnies d'ordonnance*, or Francs Archers, instituted in 1448 by Charles VII. of France.

The wars between the emperor Charles V. and Francis I. gave rise on the Continent to the first important improvements in the construction and use of heavy artillery. According to Templehof it was then that some efforts were made to establish a system of proportions between the length, the thickness, and the calibre of ordnance; that gunpowder was improved, and that certain relations between the charge of powder and the weight of the projectile began to be established. It was not however till the beginning of the seventeenth century that artillery, which had before been chiefly used in the attack and defence of fortresses, began to be extensively employed in engagements between hostile armies; but in 1632 the Austrians and Swedes together are said to have brought into the field 2000 pieces, among which were 24, 16, 12, and 6 pounder guns.

An artillery capable of accompanying the rapid movements of cavalry was first systematically introduced in warfare by Frederic the Great; but the full development of the important services which are capable of being rendered by this arm is due to the Prussian general Scharnhost, since whose time the horse-artillery, as it is called, has been considered as an indispensable requisite in the armies of every nation in Europe.

In the British service the management of the military rockets invented by Sir W. Congreve is assigned to a particular troop; and though these missiles have not been yet very generally employed, they have occasionally rendered considerable service. [ROCKET.]

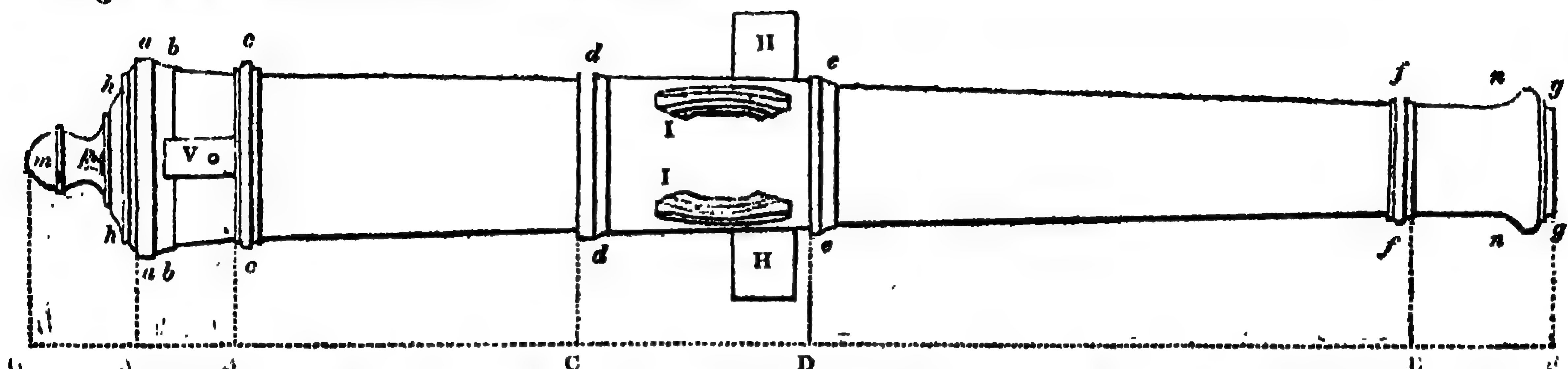
The materials of which ordnance is formed are iron and brass; the latter being a mixed metal composed of copper and tin, in the proportion of from 8 to 12 parts of the latter to 100 parts of the former. Iron guns are stronger than those made of brass, and consequently they are better able to resist the effects of the long continued firing which takes place at the sieges of fortresses. Brass guns, on the other hand, being lighter, are more conveniently transported from place to place with troops in the field, and they are strong enough to resist all the firing which can be required to be made from them in any general action. It is said that in the campaigns of the duke of Wellington, in Spain, 120 rounds were fired in one day from brass ordnance; and that from 300 to 350 rounds were fired constantly, in the same time, from iron 24-pounder guns.

Ordnance is now cast either in loam or in dry sand; and the latter material is said to be preferred because it permits the surface of the gun to be more correctly formed, and renders it unnecessary to complete the figure of the piece by the process of turning. To make the mould for casting in sand, a model or pattern of the gun is executed, in parts, of wood, or more properly of brass; these parts are placed severally within what is called the gun-box, which is of cast-iron, and consists of portions corresponding to those of the model. Between the latter and the interior surface of

the gun-box the sand is then well rammed; and when the whole of the moulding is thus formed, the gun-box is taken to pieces, the several parts of the mould are fitted together, and in this state dried at a stove. Lastly, the mould being placed in a vertical position, with the breech or thicker part downwards, and its interior surface having been painted in order to prevent adhesion to the metal in casting, the melted iron or brass is suffered to flow in through a pipe at the upper extremity of the mould, on one side of what is called the dead head (a mass of metal which, in casting, is formed beyond the muzzle extremity of the gun). In 12 hours after being cast, the mould may be removed, and the gun may be bored. [CANNON.] Guns, carronades, howitzers, and mortars are all cast and bored in the same manner.

Iron guns are cast from pig-metal of different qualities, which are melted together in order to produce a composition possessing only that degree of hardness which will permit the boring to be effected. Ordnance formed of cast-iron and of gun-metal being apt to run at the vent in consequence of the heat produced by rapid firing in action, the vent in guns of the former kind is drilled in a bolt of wrought-iron, and in those of the latter kind, in a bolt of pure copper: the bolts are then screwed into the pieces for which they were intended.

The following cut shows the form of a brass gun whose proportions are those of a heavy 6-pounder; and we have subjoined a table of the dimensions and weights of the principal natures of guns in use in the British service. The natures and uses of carronades, howitzers, and mortars have been already described under those words.



AF is considered as the length of the gun (= 7 feet). AB is called the vent-field (= 5·5 in.). V the vent. BC the first reinforce (= 20·9 in.). CD the second reinforce (= 13·3 in.). DE the chase (= 35·8 in.). EF the muzzle (= 8·5 in.). AG the cascable (= 6·2 in). HH the trunnions. II the dolphins or handles.

aa is called the base ring (diam. = 11·75 in.). *bb* the base ring ogee. *cc* an astragal and fillets. *dd* the first reinforce ring and ogee (diam. = 9·8 in.). *ee* the second do. (diam. = 9·5 in.). *ff* an astragal and fillets (diam. at *nn* = 6·33 in.). *gg* the muzzle mouldings. *hh* the breech ogee and fillets. *k* the neck. *m* the button.

	Nature of Ordnance.		Calibre in inches.	Length of Gun in Calibres	Length of Gun in Inches.	Length of Bore in Calibres	Weight. cwt.	qr.	lb.
Brass Guns	12-Pounders	med.	4.623	17.0	78.6	16.13	18	0	0
		light	4.623	13.0	60 08	12.24	12	0	0
	9-ditto		4 2	17.0	71.4	16.13	13	2	0
	6 ditto	heavy	3.668	22 9	81.0	21.91	12	0	0
		med.	3.668	19.63	72.0	19.0	9	1	2
		light	3 668	16.36	60.0	15.67	6	0	0
	3 ditto		2.913	22.72	72.0	22.12	6	0	0
			2.913	16.48	48.0	15.79	3	0	0
			2.913	12.36	36.0	11.67	2	1	0
	2-ditto		2.019	29.72	60.0	28.72	2	2	11
Iron Guns.	10-inch		10.0	9.0	90.0	8.86	56	0	0
	68-Pounders		8.05	10.0	80.5	10.0	50	0	0
	42-ditto		7.018	16.24	108.5	15.24	65	1	0
	32-ditto		6.41	17.9	108.5	16.72	55	2	24
			6 41	14 98	96.0	14.0	47	2	24
	24-ditto		5.823	19.53	108.5	18.46	50	0	16
			5 823	15.45	84 5	14.42	40	0	8
	18-ditto		5.292	20.4	108.0	19.22	42	0	12
			5.292	18.13	96.0	16.95	37	2	12
	12-ditto		4.623	23.86	108.0	22.11	33	3	24
			4.623	22.06	96.5	20.81	33	0	0
			4.623	19.47	84 5	18.22	29	2	8
	9-ditto		4.2	25.71	108.0	24.4	31	0	2
			4.2	24.28	96.5	23 0	28	2	8
			4.2	21.42	84.5	20.13	26	0	4
			4.2	20.0	84.0	18.68	24	3	27
	6-ditto		3.668	27.81	96.5	26.4	23	0	4
			3.668	21.26	72.5	19.89	18	0	0
			3.668	19.63	72.0	12.25	17	0	4
Carronades.	68-Pounders		8.05	7.70	61.72	7.70	36	0	0
			8.05	5.96	48.0	5.96	29	0	0
	42-ditto		6.84	7.52	52.42	7.52	22	0	0
	32 ditto		6.25	7.63	47.71	7.63	17	0	0
	24-ditto		5.68	7.66	43.32	7 66	13	0	0
			5.69	6.34	36.0	6.34	11	2	0
	18-ditto		5.16	7.69	29.3	7.52	10	0	0
			5.16	5.45	28.0	5.45	8	1	0
	12-ditto		4.52	5.78	32.36	5.78	6	0	0

The axis of the trunnions is at right angles to that of the gun, and is usually about half their diameter below the latter axis; but Dr. Gregory, in his 'Lectures on Gunnery,' recommends that it should intersect the axis of the gun, in order that the recoil of the piece in firing may be more steady. The vent is two-ninths of an inch in diameter, and it enters the bore at about eight-tenths of an inch from the bottom of the latter.

The diameter of the bore is called the calibre of the gun; this is rather greater than the diameter of the shot by which the nature of the gun is designated, and the difference between them is called the windage. [WINDAGE.]

A scale of quarter degrees is graduated on the base ring, the zero line being in a plane passing through the axis of the gun and cutting the exterior surface immediately above the trunnions, and the intersection of such plane with the side of the muzzle is marked by a notch on the latter. These quarter-sights, as they are called, serve to give the gun an elevation not exceeding three degrees; and this is accomplished by lowering the breech till the division expressing the intended elevation and the notch on the side of the muzzle are in a line with the object. The axis of the gun will then be inclined to a plane passing through the object and the axis of the trunnions, in an angle equal to that which is indicated by the division above mentioned.

A point-blanc disposition of the gun is that in which the zero notch on the base ring and that on the side of the muzzle are made to coincide in direction with the object, whether this line of direction be or be not parallel to the horizon. But when a notch on the top of the base ring and one at the top of the muzzle are made to coincide in direction with the object, the gun is said to have the *line of metal elevation*. [GUNNERY, p. 493, col. 1.] The angle which the axis of the gun, in this case, makes with a plane passing through the trunnions and the object is about one degree.

For elevations greater than three degrees a tangent scale is employed; this is a brass rod which slides up and down in a groove formed in the direction of a diameter to the base-ring of the gun, and is divided into quarter degrees. In using this scale the latter is drawn up till the graduation expressing the intended elevation is at the surface of the base ring; then the breech of the gun is lowered till a notch at the top of the scale and that at the top of the muzzle are in a line with the object. The axis of the gun (allowance being made for the difference between the semidiameters of the base ring and muzzle [DISPART]) is then inclined to a plane passing through the trunnions and the object in an angle indicated by the said graduation.

The iron employed in gun-making is now so much refined and the processes of casting and boring are so much improved, that it has been found practicable to diminish considerably the quantity of metal in iron guns, and thus to facilitate greatly their transport from place to place; accordingly iron ordnance is at present cast with much lighter proportions than formerly. So much advantage also is now obtained from the more uniform density and the more perfect sphericity of shot, that it has even been found convenient to *ream up* (scrape out or re-bore) the existing ordnance, so as to bring each nature of gun to the next higher calibre.

Thus the old iron 6-pounders have been converted into 9-pounders; 18-pounders into 24-pounders, and so on. The practice was first recommended by Colonel Paixhans, in France, and it has lately been adopted in this country.

The application of locks to naval ordnance was introduced by Sir Charles Douglas (captain of the fleet to Admiral Rodney in the action of 1782), and their efficiency has since been fully recognised. At first the locks were made with one flint only, and in the event of this becoming unserviceable the loss of time attending the fixing a fresh flint was found to be so great, that instead of renewing the flint, recourse was generally then had to the lintstock or port-fire. But this defect has been removed by the construction of a lock which carries two flints, so disposed, that on the failure of one, by simply turning the nut, the other may be brought into use. This improvement was made in 1818, by Major-Gen. Sir Howard Douglas; it was immediately introduced in the British navy, and has since been adopted in the land-service artillery.

From experiments made in France it has been ascertained that hollow shot, being with equal weight greater in diameter than such as are solid, when fired with low charges of powder against ships, produced most dangerous breaches in their sides; and, in consequence, certain heavy iron howitzer-guns for discharging such missiles have been introduced in the French navy. Similar experiments, attended by like results, were in 1828 made in this country by the late General Millar with a short and massive 12-inch gun which he invented on the occasion. The hollow shot projected from this piece of ordnance weighed 120 pounds, and being impelled by 11 pounds of powder, producing an initial velocity of 1000 feet per second, it pierced, at the distance of 400 yards, a strong frame-work of timber, making an opening which would have seriously compromised any ship so struck. A conviction of the necessity of using these powerful arms in a future war has led the British government to adopt them in the royal navy, and now the ships of war always carry a certain number of such guns on their lower decks. It is observed however that the effect of hollow shot cannot be depended upon at a distance of more than 400 yards if the weight of the shot is but half, nor at more than 500 or 600 yards if the weight is but two-thirds, of that of a solid shot of equal diameter.

Experiments have also been made in France on the effect of loaded or live shells as they are called, when projected horizontally into ships, the fuses of the shells being regulated so that the latter may explode as soon as they have pierced the side, and it is easy to conceive that the consequences must then be most destructive. The existence of loaded shells on board of ships has been objected to on account of the danger which might ensue from the accidental ignition of their fuses, but it is replied that this danger may be avoided by keeping each shell in a separate box, or by covering the fuse with a metallic cap till the moment when it is required to be put in the gun.

Carriages.—Carriages for ordnance are of several kinds, according to the nature of the arm or the manner in which it is employed.

Field gun-carriages consist of two cheeks or side pieces of elm, firmly attached together by transoms and resting on the axle-tree of the wheels; the trail, or rear extremity of the side pieces, touching the ground when the gun, which lies over the axle-tree, is in a horizontal position, that is, in a state for action. Generally now however, instead of continuing the two side pieces to the rear extremity, one solid or block trail of oak is firmly attached, near the axle, to two short side pieces, the other extremity resting on the ground in the case just mentioned, or being attached by a hook to the limber when the gun is travelling. The limber is a bed, with shafts, mounted on two wheels, and carrying two ammunition boxes for the service of the gun; the horses are harnessed to the limber, and the gun with its carriage is drawn after the latter. An ammunition waggon also accompanies each piece of ordnance, and there are others always in reserve.

Field howitzer carriages and their limbers are similar to those just mentioned, but stronger, and the cheeks of the carriage are farther asunder.

Carriages of a light construction are employed for the small artillery which is used on service in mountainous countries.

The travelling-carriages for siege-ordnance are made wholly of oak, and the limber carries no ammunition; the great size and weight of the gun-carriage trail not permitting, when it rests on the limber, the boxes to be placed there. The trail of siege-howitzer carriages does not touch the ground when removed from the limber, but rests and is made to run on two iron truck-wheels.

Carriages for garrison service and for the navy consist of two short cheeks or brackets, connected by transoms, and they move on four truck-wheels. Garrison carriages are now generally made of cast-iron, which is more durable than wood, particularly in tropical climates. High platforms of timber or cast-iron are also occasionally placed at the salient angles of fortresses; they are made to turn at one extremity upon a vertical pivot, the other extremity traversing through ninety or a greater number of degrees. The usual garrison carriage is mounted upon this platform, and thus the piece can be fired over the parapet in any direction at pleasure.

Mortars are placed upon solid beds of wood or iron, which are made as heavy as is consistent with the power of transporting them from place to place, for the sake of obtaining steadiness when the piece is fired. The larger kinds o. mortars and their beds are removed on platform carriages. Sea mortar-beds are made of strong timber; they have a hole in the middle for receiving the iron bolt on which the bed turns round, and they are placed on strong wooden frames fixed in the vessels by which they are carried.

The number of horses employed in the British service to draw artillery of the different natures is as follows:—For an 18-pounder or an 8-inch howitzer, from 8 to 10 horses. For a 12-pounder, 9-pounder, a heavy 6-pounder, or a 24-pounder howitzer, from 6 to 8 horses. For a light 6-pounder, a heavy 3-pounder, or a 12-pounder howitzer, from 4 to 6 horses. It may be observed here, that two horses cannot draw a weight twice as great as that which can be drawn by one; therefore the number of horses which should be applied to draw weights must be increased in a higher ratio than the weights.

Formerly two 6-pounder guns were attached to each battalion of infantry, but this practice has long been discontinued, and now all the artillery which accompanies an army into the field is formed into batteries or brigades, each invariably consisting of six pieces. The brigades of foot-artillery consist either of five medium 12-pounders and a heavy 5½-inch howitzer, or five 9-pounders and a 5½-inch howitzer; and a troop of horse-artillery is usually accompanied by five light 6-pounders, besides a light 5½-inch howitzer.

Six-pounder guns were not much employed with the armies under the Duke of Wellington, as they were found to be inferior in effect to the artillery which the French brought into action during the war; they may however be advantageously employed with a corps detached for the purpose of intercepting an enemy's convoy: but it may be observed in general, that field ordnance should be such as may take good effect against troops at the distance of 800 or 1000 yards. Twelve-pounders and even 18-pounders are necessary in the field when it is required to destroy palisades or small intrenchments, to break down bridges, and the like.

The guns hitherto employed in the attack and defence of fortresses have been 12, 18, and 24 pounders: the last are used in the formation of breaches, and the others for the purpose of dismounting the enemy's artillery by direct or by ricochet firing.

With respect to the quantity of ordnance which should accompany an army into the field, no precise rule can be given, as the ratio of the number of men to that of the guns in the great armies on foot during the late wars was very various; but, according to General Lespinasse, a division of 12,000 men, including two regiments of cavalry, should be attended by three brigades of horse and three of field artillery: one brigade of each kind is recommended to be always with the division, another of each kind to remain with the general *park* of artillery, and the rest with the depôt in rear of the army.

The principle which should govern a commander in the choice of guns for naval actions is, according to Sir Howard Douglas, that with equal calibre they should possess the greatest point-blanc range; the practical maxim for using them being to close to, or within that range, and then to fire with precision and rapidity. Long guns are now supposed, in general, to be preferable to carronades for the navy, both because their fire is more accurate, and because, when laid or pointed by the *line of metal*, the axis of the bore is more nearly horizontal in a long than in a

gun. For the sake of obtaining a nearly horizontal direction when a ship is rolling, it is a common rule in action to fire when the vessel is nearly upright; but this is said to be subject to some limitation, for it may happen that then the ship is in the trough or hollow of the sea, in which case she will have less command over her enemy than if she were on the summit of a wave: and it is recommended that shot intended to take effect on the hull of an enemy's ship should be discharged while the side engaged is descending towards the water; or if intended to act against the rigging, it should be fired with the rising motion of the side, provided the aim be taken low.

Details concerning the exercises of ordnance for land-service may be seen in Spearman's *British Gunner*, under the word 'Exercise;' and for sea-service, in General Sir Howard Douglas's *Treatise on Naval Gunnery*, Part iii.

ORDOVI'CES. [BRITANNIA.]

ORE. [MINING.]

OREBRO. [SWEDEN.]

OREGRUND. [SWEDEN.]

OREL, a government of Great Russia, is situated between 51° 50′ and 55° N. lat. and 32° 50′ and 39° E. long. It is bounded on the north by Kaluga, on the north-east by Tula, on the east by Tambow, on the south-east by Woronetz, on the south by Kursk, on the south-west by Tschernigow, and on the north-west by Smolensk. Its area is stated by Hassel, according to Reymann's Map, at 17,830 square miles; but other writers make it only 16,000 square miles. Schubert agrees with Hassel.

Face of the Country; Soil; Climate.—The country has a considerable elevation, but it contains no mountains. There are some chains of calcareous hills, and some eminences along the banks of the rivers. The soil generally consists of fine sand mixed with fertilising ingredients, and is well adapted to all kinds of grain: in some parts it is composed of a rather more compact clay and loam. There is very little unproductive land, and few heaths and morasses. Some of the rivers belong to the basin of the Dnieper, and others to that of the Wolga; but the greater part of the country belongs to the basin of the Dnieper, and slopes to the south. The principal river is the Desna, which comes from Smolensk, passes through the circles of Briänsk and Trubtschewsk, where it becomes navigable, and, having received several other rivers, runs into the government of Tschernigow. The second river is the Oka, which rises on the frontier of Kursk, and would be navigable at Orel if the stream were not obstructed by numerous mills. It receives several small rivers, by which it is so enlarged, that during the whole summer it is navigable for flat-bottomed boats of the burden of 25,000 poods (900,000 lbs.), and when the water is lower, of 15,000 poods: no part of it is obstructed by rocks. The third principal river is the Sosna, the source of which is near that of the Oka; it runs to the north-east, receives on both sides several smaller streams, and falls into the Don on the frontier of Woronetz. There are no large lakes, but the province is extremely well watered by streams. It is of a very uniform temperature and very healthy. A general failure of the crops is extremely rare. The waters are frozen at the end of November, and thaw in the beginning of March.

Natural Productions.—Orel is one of the most fertile provinces of the empire. For corn in general the ground is never manured; but when it is greatly exhausted, it is suffered to lie fallow. All kinds of corn are cultivated, a little flax, much hemp, and in some places tobacco. Horticulture is pretty general; almost every landowner has his kitchen-garden and his orchard, in which all the culinary vegetables common in Russia are cultivated; also abundance of hops, apples, and cherries, and in some parts pears and plums. There are woods and copses in all the circles. The commonest trees are birches, alders, firs, aspens, limes, elms, and willows. Oak-forests cover the banks of the Desna, but there is so much waste that they are rapidly diminishing. The chace, though a secondary occupation, is profitable, and very generally followed by the inhabitants. They hunt chiefly the fox and the hare. Birds, especially quails, are very abundant. The breed of domestic quadrupeds is better and more attended to than in the northern provinces: the horses are a fine breed, fit both for draught and the saddle, and there are many studs, which are supplied with stallions from other countries. The oxen are large and strong, and are used for draught. The sheep furnish good wool. Swine are very numerous. The inhabitants keep likewise great quantities of bees. The common domestic fowl and geese are generally kept. The mineral products are lime, millstones and grindstones, alabaster, saltpetre, and some bog-iron. No use is made of the peat which is found in the government.

Manufactures and Trade.—Agriculture and the breeding of cattle are the chief occupations of the inhabitants. The occasional employments of the women are spinning, weaving, and knitting; of the men, felling timber, and other work in the forests, lime-burning, stone-hewing, and saltpetre-boiling. There are no manufacturing establishments in the villages, and few mechanics. The country-people make for themselves almost everything that they have need of. There are however some iron-works, mills, &c. In the towns there are manufactories of coarse woollen cloths, linen, sail-cloth, table-linen, leather of various kinds, cordage, paper, colours, glass, earthenware, soap, &c. There are numerous brandy distilleries.

The chief articles of exportation are bar-iron, nails, steel, wire, window glass, brandy, bass mats, sacks, cordage, corn, flour, hemp, oil, some fir masts, balks and planks, tobacco, horses, oxen, tallow, butter, honey, wax, and other productions of the country. Almost all articles of foreign produce and manufactures of which the inhabitants are in want are procured from Moscow. The principal trading towns are Orel, Siäwsk (or Sewsk), Jeletz, and Briänsk.

With respect to the population, the same uncertainty exists as with regard to that of many other parts of Russia. Hassel, in 1821, states it at 1,270,000; Schubert, in 1835, states it at 1,229,000. Schnitler, in 1835, gives 1,300,000; yet he says that the official census for 1796 made it 935,000: and he shows, by the official account of several years between 1820 and 1830, that the average annual increase is above 20,000, which, says he, must have made a prodigious addition to the population since 1796. In fact it would make in 38 years, 760,000, which, added to 935,000, makes 1,695,000; and he himself makes three estimates, which give 1,553,000, 1,685,000, and 1,742,000 respectively, yet fixes on 1,300,000. We have reason to believe that the actual amount is a million and a half. The inhabitants are partly Great Russians, partly Little Russians and Cossacks; the great majority are of the Russian Greek church, and the head of the clergy is the bishop of Orel and Siäwsk. They have the character of being industrious and frugal, and are for the most part in easy circumstances; they however do not seek refinement, and dislike innovations.

OREL, the chief town of the government, is situated in 52° 56′ 40″ W. lat. and 36° 6′ E. long. It stands on the river Oka, where it is joined by the Orlik. The houses are in general of wood, and the interior of the town is gloomy. Up to the seventeenth century, Orel seems to have been an insignificant place; but it was then fortified, and a citadel built, part of which still remains. During the wars with the Poles, and in the time of the false Demetrius, it was frequently taken and retaken. Since that time it has rapidly increased; at the census in 1783 there were only 7762 *souls* (*i.e.* males), which implies a population of 15,000 or 16,000: in 1820, there were 20,000; and the official report of the civil governor in 1830 states the population at 31,000: it is probably (in 1840) nearly 40,000. This increase may be easily accounted for. Orel is well situated for trade; it is the entrepôt for the corn of Little Russia, and the place from which Moscow draws its chief supply. Corn and hemp are sent to St. Petersburg to be exported. Other articles are wine, procured from the southern to be sold in the northern provinces, tallow, butter, honey, wax, wool from Little Russia, hogs' bristles, and leather. There are manufactories of linen, cordage, and soap. The annual fairs are very well attended. Besides the buildings belonging to the crown, there are 20 churches, two of which are of wood, 2 convents, and a bazaar. The town, which is a bishop's see and the seat of government, has a gymnasium, a district school, and a seminary for the education of priests for the Greek church. In the vicinity there are many extensive gardens.

The other principal towns in this government are Siäwsk (or Sewsk), with 5000 inhabitants, the see of a bishop, with a seminary for 400 pupils; there are manufactures of earthenware, colours, &c; Briänsk on the Desna, with 5000 inhabitants, has a seminary, a cannon foundery, tanneries, and much trade with Kherson; Karatscheff, with 6000 inhabitants; Trubtschewsk, on the Desna, an antient town, with 3500 inhabitants; Dmitrowsk has 3000 inhabitants;

Kromy, 2600 inhabitants; Maloi-Archangelsk, 1500 inhabitants; Liwny, on the Sosna, 6000 inhabitants; Jeletz, on the Sosna, with 8000 inhabitants, has a great trade in iron wares and corn; Mzensk, at the junction of the Mezna and the navigable river Sudscha, has 6000 inhabitants; Bolchow, on the Nugra, is a well-built town, with 14,000 inhabitants. These 12 towns, including Orel, are the capitals of the 12 circles of the same names.

(Stein, 1820; Hassel, 1820; Hörschelmann, 1833; Schubert, 1835; Schnitler, 1835.)

ORELLANA. [AMAZON.]

ORELLA'NA, FRANCISCO, the first European who traversed the continent of South America, was born at Truxillo in Old Spain, about the beginning of the sixteenth century. He was of a good family, and, like many others of the same class, went to the New World to seek the wealth which he wanted at home. He accompanied the successful expedition of Francisco Pizarro to Peru in 1531. A cacique having reported that a country existed beyond the mountains east of Quito, abounding in gold and silver, cinnamon and other aromatic productions, the love of enterprise and the greediness of the Spaniards were excited. Gonzalez Pizarro, brother to Francisco, undertook to penetrate the trackless forests and snowy mountains lying between the city and this desirable country.

Orellana attached himself to Gonzalez, and they set forward on their expedition in 1540. The natural impediments they met with were severe, and the earthquakes, thunder, lightning, and torrents of rain which they experienced, by cutting off their communications, reduced them to the greatest extremities. At length they reached the province of Zumaco, where they found the cinnamon-tree growing in great abundance. From Zumaco, Gonzalez explored the country to the east, and followed the course of a river, supposed to be that branch of the Marañon called the Napo, for 200 leagues, when the supply of roots and berries on which they had been living became so scanty, that some expedient was necessary to obtain provisions. Accordingly, Orellana was ordered to proceed down the river in the bark which they had built, and having loaded her with provisions, to return immediately, leaving the baggage behind him. Orellana went forward until he arrived at the confluence of this branch with the main stream. He found however nothing but impenetrable forests and flooded plains. Either the ambition of discovery or the utter inability of his exhausted crew to row back against the heavy stream induced him to proceed. They were put to the greatest straits; they eat their shoes and saddles, many were killed in frays with the Indians on the shores of the river, and mutinies broke out among his people, which were only quelled by the firmness of Orellana. Having by his skill and perseverance overcome all these difficulties, he reached the sea in August, 1541, having navigated this vast river above one thousand leagues. On his return to Spain he spread such wonderful reports of the 'El Dorado' that he had passed through, of the temples roofed with gold, and of the Amazons inhabiting the banks of the river, that he soon obtained numerous followers, and the king of Spain granting him extensive possessions, he returned to the river Amazon in 1549, but shortly after fell a victim to one of the diseases prevalent in the low and swampy situations of the tropics. We know nothing of the details of the countries through which Orellana passed, nor was it until lately that any persons were willing to undertake so difficult and dangerous a journey. Lieutenant Maw, R.N., performed it in 1828, and Lieutenant Smyth, R.N., in 1834.

ORENBURG, the most westerly government of Asiatic Russia, is situated between 47° and 56° N. lat. and 50° 20′ and 64° 20′ E. long. It is bounded on the north by the government of Perm, on the north-west by Wiätka; on the west by Casan, Simbirsk, Saratof, and Astrachan; on the east and south by the steppe of the independent Kirghises, and on the north-eastern extremity by Tomsk and Tobolsk. Its area, according to Schubert (with whom Arsinief and others agree much more nearly than usual), is 118,650 square miles: Hörschelmann however makes it 134,400 square miles. It is divided into twelve circles.

Face of the Country; Soil; Climate.—Towards the south, in the country of the Cossacks of the Ural, the government is a steppe, which is destitute of trees, and only produces the plants peculiar to saline countries. Beyond the mountains it is a plain intersected by morasses and a great number of lakes; on this side of the mountains the surface is undulating, remarkably varied, and often very picturesque. To the north, where the Ural chain enters the government, it is called the Baschkirian Ural; the part which runs directly south, parallel with the river Ural, which it meets by making a sudden bend from east to west, is called the Gouberlin mountains, branches of which, stretching from east to west, extend into the government of Astrachan, and form what is called the Obstschei-Syrt. The base of the Ural chain is granite; the upper rocks are calcareous and quartz, sometimes bare, and covered with erratic blocks, and sometimes covered with a sufficient depth of sand and earth for the trees to take root. Immense caverns open into the interior of these mountains. The whole of the western part is fertile. The principal river is the Ural, which rises in the Ural mountains in the district of Troitsk, and forming in part of its course the western boundary between Orenburg and Astrachan, discharges itself by several mouths into the Caspian in 47°. N. lat. Its entire course, which is rapid and winding, but without falls, is above 1600 miles; its breadth, which is only 60 feet at Orskaia, and 150 at Orenburg, increases to 480 feet, but the water is so shallow that it is navigable only for very light vessels. It is however a very useful barrier to protect Russia against the nomade tribes of the steppes. Other rivers are the Kama, the Sakmara, which falls into the Ural, and the Belaia, at the conflux of which with the Ufa, the chief town Ufa is situated. There are numerous lakes, salt as well as fresh, on both sides of the Ural mountains. The Kamunisch-Samarskoi lake is, properly speaking, composed of six small lakes, which sometimes form one great sheet of water 130 miles in circumference. The climate varies considerably between the north and the south; and it is much more rigorous to the east than to the west of the Ural chain. In the steppes the heat in summer is very great. The winter is generally cold, and even in summer the nights rapidly become cool. The greatest degree of heat at Orenburg is + 33° Réaumur (106¼° Fahr.), and the greatest cold − 23° Réaumur (− 19¾° Fahr.). Whirlwinds and hurricanes are frequent, and the sudden transitions from heat to cold produce fevers and other disorders; yet it does not appear that the mortality is unusually great. The want of rain and the swarms of locusts are very distressing, especially in the south.

Natural Productions.—Agriculture, in which the Tartars, and next to them the Russians excel, is in general flourishing, and is favoured by the goodness of the soil. The chief grains are rye, barley, oats, buckwheat, and millet. The inhabitants grow but little flax, hemp, tobacco, and vegetables. The forests are of immense extent, but there is an enormous consumption of wood in the forges, for making charcoal, for the preparation of tar and potash, and for building houses and barks. Game is abundant in the forests, and the lakes abound in water-fowl. The golden eagle of the Ural may be tamed and trained for the chase. The chief wealth of the government consists in its horses and cattle. The former, which are of Tartar or Baschkirian breed, are handsome and strong; the Baschkirs and Metscheriaks have herds of 200, 1000, and even 2000 horses; the Russians, the Cossacks, and the Tartars, of 50 or 100. All have great numbers of oxen, goats, and more especially of sheep, of which a nomade will have from 500 to 4000, and the stationary inhabitants 400 or 500. The Christians possess great numbers of swine, and the nomades camels or dromedaries. The fishery in the Belaia and the Kama suffices for the consumption of the inhabitants; and that in the Ural is a source of considerable advantage to the Cossacks. This government possesses likewise great mineral wealth in the various mines; it produces gold in great abundance [URAL MOUNTAINS], copper, iron, and a great quantity of salt, which is procured from the mines of Iletzk, where the rock-salt is found four or five feet under the sand in beds covered with gypsum; the Cossacks however obtain their salt from the lakes. The other mineral products are asphaltum, sulphur, vitriol, marble, alabaster, agates, &c.

The *Population* of Orenburg, now estimated at 1,525,840, is extremely mixed; it consists of Great and Little Russians, besides some Finns, Cossacks, Tartars, Baschkirs, Teptjiars, Metscheriaks and Calmucks, Tschouvaches, Tcheremisses, Mordwins, Kissilbaches, and Armenians. The great majority are Russians; next to them are the Turks or Tartars, and the Baschkirs (about 15,000 families). Almost the whole of these ignorant, rude, and warlike people inhabit a district at the foot of the Ural chain, which is called

after them, Baschkirs. They live by the breeding of cattle and bees; by the chase, and agriculture. They dwell in the summer under tents made of felt, and in winter in villages.

Manufactures and Commerce.—There are few manufacturing establishments in comparison with the extent of the country, the inhabitants in general being able to provide for their own wants. The women are extremely skilful in weaving and dyeing. The working of the mines employs a great number of hands. But manufacturing industry has made great progress within the last thirty years. According to the journal published by the direction of the government, there were, in 1838, 187 different establishments, which employed above 4000 workmen, not including those in the smelting-houses and founderies of the Ural mountains, or those in the manufactory of arms at Zlutoust: 68 tanneries dressed 30,000 skins a-year; six millions and a half pounds of potashes were made in 70 establishments; there were 10 great brandy distilleries, one brewery, 7 manufactories of woollen cloth for the army, 43 tallow-melting houses, 2 candle manufactories, and 1 glass-house.

There are some remarkable facts connected with the commerce of this government. It is carried on partly with the nomade tribes in the government itself, who exchange their horses, cattle, furs, carpets, and blankets of felt or wool, for English and Russian manufactures, brass, copper, and iron articles, and partly with the Kirghises and people of Bokhara, whose caravans come to Orenburg or Troitsk, the two chief commercial towns, where there are custom-houses. Through the same channel many goods are exported to Khiva, Bokhara, Taschkend, and the Kirghis steppe. The articles exported to the interior of Russia in Europe are chiefly the mineral products, many of which are sent to the ports on the Baltic. These caravans coming from Bokhara bring likewise the productions of that country, especially raw and manufactured silk and cotton, and also Cashmere and Persian shawls, indigo, Chinese goods, tea, &c. The fair of Orenburg has lost much of its importance since the merchants from Bokhara have been permitted to frequent the fair of Nischnei Novogorod. Orenburg is now only the place through which the caravans pass on their way to Europe; the Russian merchants residing there have however always opportunities to purchase goods from Bokhara, both for this government and that of Casan, while the merchandise which has been brought so far by camels is unloaded in order to be forwarded to Europe in waggons. In 1833, 14 caravans arrived at Orenburg, consisting of 2547 camels and 27 horses, with goods to the value of 3,551,198 rubles; and 13 caravans were despatched to the frontier, consisting of 4769 camels and 264 draught horses, with goods to the amount of 3,557,922 rubles. In 1838, eight caravans arrived, one of which consisted of 334 and another of 3206 camels. Twelve caravans were sent from Orenburg.

Education and Religion.—For public instruction Orenburg depends on the university of Casan, but education is very limited; according to the latest accounts that we have seen (1833), there were seven schools, with 30 teachers and 625 scholars, all males. The Mohammedans study at the high school of Gargali; a school was opened in 1833 at Tscholiaba, at the foot of the Ural Mountains, in the midst of the Baschkirs. The Russian clergy had also seven schools, with 21 masters and 564 scholars. The Tartars have schools attached to most of their mosques. There are two printing-offices, supported by the crown. Most of the inhabitants, the Great Russians, many Little Russians and Cossacks, and almost all the proselytes, Tscheremisses, Tschouvaches, Mordwins, &c. are of the Russian Greek religion. Most of the Little Russians and Cossacks are Rossolnicks. Of the other Christians, the Armenians and Lutherans have their churches. The Mohammedans, whose Mufti, assisted by a council, resides at Ufa, have 1714 mosques, of which 1084 are of the first class, with 2219 Imans, Mollahs, and other attendants. All the Tartars, the Baschkirs, Calmucks, Teptjiars, and Metscheriaks are of this religion.

The civil government is organised like those in Great Russia, but does not extend to the Kirghises and Cossacks, who are under a military governor, whose chief business is to provide for the security of the frontier, which is defended towards the Kirghis steppe by a line of fortresses, and by the Cossacks, the Metscheriaks, the Baschkirs, and the Calmucks, who in consideration of this service are exempt from all taxes to the government. The forts on the line of the Orenburg extend from Iletzkaja-Kreposth to the river Tobol in the north, at the distance of three miles from each other. From Iletzkaja-Kreposth southwards to Gurief is the line of the Cossacks of the Ural, defended in like manner by a long series of small forts.

ORENBURG, formerly the capital of the government, is situated in 51° 46′ N. lat. and 52° 31′ E. long., in a vast plain at the conflux of the Sakmara and the Ural: it is of an oval form, pretty regularly built, and well fortified. The population is stated to amount to 20,000. There are nine Greek churches, one Lutheran church and school, a military academy for eighty pupils, a great European bazaar with 180 shops in the town, and an Asiatic bazaar with 492 shops in the Kirghis territory, a league from the town, which is the depôt for the merchandise of Central Asia and of Russia. The Kirghises bring annually between 300,000 and 400,000 broad-tailed sheep, horses, skins, carpets of divers colours; the Bokharians bring gold in grains, Persian gold and silver coin, lapis lazuli, precious stones, lamb-skins of a shining black colour which are worth a ducat in Bokhara, and at Orenburg sixteen shillings English a piece. There are at Orenburg 1000 exiles, for whom there is a very well arranged workhouse. The military governor resides here.

Ufa, the present capital, a fortified town at the conflux of the Ufa and the Belaia, has 6000 inhabitants, half of whom are Tartars. The public institutions and buildings are a gymnasium, a poor-house, a lunatic asylum, seven churches, and two convents. It is the see of the bishop of Orenburg, and the residence of the Mohammedan Tartar Mufti.

(Schnitler, *La Russie, la Pologne, et la Finlande*; Stein's *Handbuch*, edited by Hörschelmann; Eversmann, *Reise von Orenburg nach Buchara*; Ermann, *Reise nach Nord Asien*, 8vo., 1833; *Reise nach dem Ural*, &c., von A. von Humboldt, G. Ehrenberg, and G. Rose—vol. i., by G. Rose; *Russian Official Journals*.)

OREOCI'NCLA. Mr. Gould's name for a genus of birds inhabiting the Himalaya Mountains and New Zealand. The species from the latter locality (*Oreocincla macrorhyncha*) is nearly allied to, but differs from, *Turdus varius* of authors. In the British Museum. (*Zool. Proc.*, 1837.)

ORFA. [MESOPOTAMIA.]

ORFORD. [SUFFOLK.]

ORFORD, EARL OF. [WALPOLE, HORACE.]

ORGANIC REMAINS. By this term geologists understand the numerous reliquiæ of vegetables and animals which occur among the stratified rocks. The same objects receive also the name of organized fossils, and, with less precision, the titles of petrifactions and fossils. Some of these objects are obviously parts of animals and plants, and retain their original structure, more or less altered by chemical agencies since their sepulture in the earth; others are earthy, stony, or metallic bodies, moulded within or upon parts of animals or plants, and thus resembling those parts in external aspect, but having none of their internal organic texture. Further, we must not exclude from the notion of the 'remains of organic beings' the few cases where *marks* of vital action and movement occur on the surface and in the interior of rocks, such as the foot-prints of quadrupeds on the sandstones of Cheshire and Dumfriesshire, the holes made by lithophagous conchifers in the limestone of Mendip, and the perforations of the valves of conchifers by zoophagous mollusks.

A philosophical view of the bearings of this great branch of modern geological science requires the consideration of the following questions:—

1. What are the tribes of animals and plants which occur imbedded in aqueous deposits of great antiquity, or (as rather improperly termed) in a 'fossil' state?

2. In what condition are they preserved?

3. In what manner are they distributed in the earth?

§ 1. *Tribes of Fossil Animals and Plants.*

Judging from published catalogues and the course of discovery, the living creation may be estimated to contain 100,000 plants, and far more than double that number of animals. In a fossil state we may say, in round numbers, that 1000 plants and 10,000 animals have been accurately discriminated and classified. The numerical proportions vary according to the groups of plants and animals selected for comparison.

In 1828, M. Adolphe Brongniart, after examining the richest collections then known of fossil plants, gave the following interesting comparative table of fossil and recent species:—

Class of Plants.	Fossil.	Recent.
Agamia	27	7,000
Cryptogamia cellulosa	2	1,500
„ vasculosa	266	1,700
Phanerogamia gymnospermia	57	150
„ monocotyledonea	49	8,000
„ dicotyledonea	100	32,000
	501	50,350
Or	1 to	100

In 1830 Professor Phillips drew up some comparative tables of fossil and recent animals, which were inserted in the 'Encyclopædia Metropolitana.' One of these is subjoined:—

Remains of Animals.

	In the Strata.	In superficial Accumulations.	Living estimated.
Mammalia	35	109	} 1,100
„ Cetacea	8	.	
Birds	few	few	5,000
Reptiles	71	.	2,100
Fishes	183	.	5,500
Insecta	74	.	100,000
Crustacea	104	.	500
Annulosa	104	.	1,000
Cephalopoda	788	.	100
Pteropoda	5	.	50
Gasteropoda	880	.	3100
Conchifera	2,026	.	1,790
Tunicata	.	.	.
Radiaria	278	.	1,000
Polypiaria	476	.	1,000
	6,027	109	122,100
Or	1	to	20

The relative proportions of recent and fossil animals and plants, taken according to their terrestrial, fresh-water, or marine residence, were thus estimated by Professor Phillips in 1836 (*Guide to Geology*, 3rd edition):—

	Recent.	Fossil.	Proportions.
Terrestrial plants	59,000	500	118 to 1
„ animals	115,500	330	350 to 1
Fresh-water plants	100	40	2 to 1
„ animals	3,560	260	14 to 1
Marine plants	1,000	40	25 to 1
„ animals	11,750	6,065	2 to 1

Discoveries since made show that *all* the tables referred to contain estimates much below the truth; both plants and animals have been found to nearly twice the tabular numbers (fishes, for example, in 1838, were stated by Agassiz to be 800 fossil and 8000 recent); but as the proportions are not very materially affected, we shall not attempt the difficult task of constructing new tables suited to the present amount of knowledge.

The extreme paucity of terrestrial plants and animals in a fossil state is a circumstance very easily accounted for by the analogy of modern nature; for if few of the 60,000 plants and hundreds of thousands of animals find their way by inundations or other causes to modern lakes and oceans, we have no reason to expect the remains of the antient terrestrial fauna or flora to abound in the antient marine or lacustrine sediments. We must therefore always acknowledge the imperfection of the picture which organic remains present to us of the vegetables and animals which antiently covered the early dry land of our planet. On the other hand, the large proportion which fossil shells and zoophyta bear to the corresponding recent classes (nearly as 1 to 1, if the hard parts of the recent objects are alone considered), is exactly what might *à priori* be expected in examining sediments from water; and we may confidently affirm that from data so ample (corroborated by fossil fishes already bearing a proportion of 1 fossil to 10 recent), the condition and character of the antient oceans and lakes may be in a considerable degree known.

Organic fossils bear so general an affinity to existing races, that they may all be conveniently ranked in the same great classes; generally in the same great orders and families; sometimes in the same genera, but rarely, and only in the least antient strata, in the same species. It is very common to speak of them as the 'organic remains of a former world,' but the relations which appear between the existing creation and the imbedded plants and animals are much more various than this expression implies. We shall see in another part of this article that it would be more correct to speak of organic remains as belonging to several successive conditions of the world, all preceding and preparatory to its actual state.

§ 2. *Conservation of Organic Remains.*

The imperfection of innumerable specimens of fossil plants, shells, fishes, &c., is not entirely nor principally owing to the chemical and mechanical agencies which have been exerted to modify their aspect and substance; on the contrary, the broken condition of many fossil trees, and the scattered situations in which their stems, leaves, and fruits occur, and in some cases the loss of part of their structure, are to be ascribed to the turbulent action which accompanied their inhumation, and to the exposure and decomposition which they had previously sustained. Among fossil bivalve shells it is very common to find the pieces separated by the decay of the hinge ligaments; not unfrequently the shells are broken; sometimes they are rolled and worn. These accidents preceded their inclusion in the rocks, and they are indications not to be mistaken of the condition of the waters in which the mollusca lived, and the rate and circumstances of the deposition of sediment.

In whatever condition buried, the remains of plants and animals have been subsequently affected both by mechanical and chemical forces: the effect of the former is evident in the compressed ammonites of Watchet, Tytherton, and Speeton, in the goniatites and pectens of Bradford in Yorkshire, and in the fishes and ichthyosauri of Charmouth. Some of the most interesting cases of this mechanical compression are commonly witnessed among the shales and gritstones which cover coal; for the large cylindrical stems of sigillaria and lepidodendron lie *flat* as paper *between the laminæ of shale*, but appear with a depressed elliptical section when they lie *obliquely across the grits*, and retain their *cylindrical* figure whenever they stand *erect* in the rocks.

It is an error to apply to all 'organic remains' the title of petrifactions; a large proportion have undergone some chemical changes, and many have really been impregnated with stony particles; but there is a vast number of tertiary, secondary, and primary fossils which are in no true sense 'petrified.' To judge of the antiquity of organic remains by the degree of their petrifaction would lead to false and empirical results; and, in fact, there are several examples of complete petrification of vegetable substances belonging to the actual creation and historical times. Thus the woodwork of a Roman aqueduct near Lippe in Westphalia (see Mr. Stoke's *Notice in Geological Proceedings*, 1835) is partly petrified; the wood and nuts of the hazel are petrified in a singular manner at Ferrybridge, and on the shores of Lough Neagh; while on the other hand the wood of the lias and Kimmeridge clays is still inflammable.

Some of the conditions of preservation in which fossil plants appear may be thus classed:—

1. The plant little altered; as in the brown coal formations of the Rhine, and in a particular case at Gristhorp near Scarborough, among the oolites, where Solenites Murrayana of Lindley is found flexile, elastic, and with its tissues distinct. The same thing was observed by the author at Ardwick near Manchester, in the coal formation.

2. The plant carbonized to jet or coal. This *conversion* of the vegetable substance is very common in clays of every geological age; plentifully so in the coal formation.

3. The substance of the plant entirely removed from the place that it occupied, leaving a hollow where it was deposited. This happens in coarse gritstone, as near Leeds.

4. The cells of the plant filled with extraneous matter, as carbonate of lime in Lepidodendron Harcourtii (see the *Fossil Flora of Great Britain*), pyrites in the fruits of Sheppey, silica in the wood of Woburn.

The remains of the animal kingdom present a parallel series:—

1. Bones of vertebrata generally, scales of fishes, the coverings of crustacea, are often but slightly changed from their original composition. They often retain the gelatinous parts of their mass.

2. Shells, corals, and echinodermata, composed of carbonate of lime with gelatine, have in some cases (and very often among tertiary strata) not lost the whole of their gelatinous part. From this condition of little change there is every gradation observable, till (in the oolites particularly) the whole of the organic substance has been entirely removed, and a cavity is left in its place. The sides of this cavity

retain the *impression of* the external surface of the coral or shell; and it not unfrequently happens that in the cavity once occupied by a shell is an almost unattached mass of stone, which filled the interior of the shell, and represents the figure of the animal, in several respects, perfectly.

3. Into this cavity carbonate of lime has been again introduced in solution, so as to become clearly crystallized in solitary rhomboids, or in a connected mass, replacing completely the gelatine and carbonate of lime which composed the original shell; in other cases silica, and, rarely, iron pyrites, fill up the vacuity.

4. The green-sand formations show abundance of examples of the impregnation of the calcareous substance of shells, corals, and echinodermata, with a siliceous infiltration.

Now the chemical changes thus briefly sketched, in the substance of plants and the hard parts of animals, are found partly dependent on the original nature of the bodies and partly on that of the rocks in which they occur. In almost all sorts of rocks, belemnites and ostracea retain their fibrous or lamellar structure; in the oolitic rocks calcareous impregnations abound, and in the green-sands most of the shells, spongiadæ, &c. are siliceous.

§ 3. *Distribution of Organic Remains in the Earth.*

The occurrence of organic remains is not known to be dependent on depth below the surface of the earth or on particular height above it. Fossil plants occur in our deepest collieries, and fossil shells crown very lofty points of the Alps and Pyrenees. Yet, because of the limited thickness of the strata, and the entire absence of organic reliquiæ from the granite masses below them, it is evident that at the depth of a few thousand yards below the surface, in most situations, the traces of antient life end. In like manner, because in general the *lower strata*, in which few or no organic forms remain, rise to the highest ground, many mountain ranges are almost or absolutely deficient in fossils. Upon the whole these are most numerous in the lower parts of the earth's surface, because the formations there occurring are generally of a later origin than the stratified rocks which are uplifted into mountain-chains.

In modern oceans the occurrence of marine mollusca, zoophyta, &c., in a living state, is either known or inferred to be limited to moderate depths, from 10 to 100 or 1000 feet; when therefore we reflect on the vast abundance of shells in the Silurian strata, buried beneath several thousand feet of old red-sandstone, or of the comparable phenomena presented by the mountain-limestone shells which are covered by 3000 or 5000 feet of coal strata, we see clearly in these cases the *probability* (independent of the *proof* deduced from considering the nature and position of the rocks) of the occurrence of great upward and downward movements affecting large breadths of the ancient oceans.

Shells, fishes, and polypiaria affect, while living, peculiar situations; the rocky, sandy, and argillaceous parts of the sea-bed yield radiaria, cardiacea, and ostracea in very unequal abundance, and it is worth inquiry how far such relations and peculiarities can be discovered among fossil reliquiæ. If antiently vegetables were swept down by inundations from the land and buried in marine or fresh-water deposits, we ought to find some correspondence between these deposits and the sediments which now, in various parts of the world, are drifted with the trees and herbs to great inland lakes, æstuaries, or the open sea. This expectation is justified by observation. It is almost exclusively in arenaceous and argillaceous strata, which for other reasons geologists have inferred to be detrital deposits, that we find the specimens of terrestrial herbs and trees, mostly fragmentary, and often accumulated in irregular patches. This is well seen in the arenaceous strata of the Yorkshire coast. Again, it is principally in limestones that we find the lamelliferous corals and a large proportion of the echinodermata, and this is in accordance with observation of the analogous living races. Some of the antient limestones (as at Torquay, Aymestry, Gursdale, &c.) appear in fact to be composed of little else than the hard parts of polypiaria and echinodermata, and thus closely approximate to some modern coral reefs. Another example of this accordance of habits of life between fossil and recent groups may be taken from the ostracea, which abound remarkably in the argillaceous strata and on the mud-banks of modern seas. One fossil species (*Ostrea deltoidea*) forms *continuous beds* in the Kimmeridge clay of England and France, almost unmixed with other shells, and extending many miles near Weymouth, in North Wilts, in Yorkshire, and at Hâvre. In collecting fossils from the oolitic or carboniferous systems of strata, the abundance of fossils in the calcareous parts, contrasted with the paucity of them in the sandy beds, strikes every observer, and by carefully attending to these and other cases of the definite relation which fossils present, both as to number and kind, with particular sorts of rock, geologists may hope by degrees to arrive at just views regarding the circumstances of the existence of antient marine animals, the conditions and directions under which terrestrial plants were drifted, and the manner in which both classes of fossils have been buried in chemical sediments or mechanical aggregations.

But the circumstance to which the laws of distribution of organic remains in the earth are most distinctly and constantly related, is the antiquity of the strata. This will appear from the following brief statements.

In the oldest of all the strata known to geologists, the gneiss and mica schist systems, which repose upon the unstratified granites and congeneric rocks, few or rather no traces of organic life appear. Hence it is that organic fossils appear excluded from particular geographical areas, as for example frequently from the interior parts of great mountain-ranges, which are generally composed in a considerable proportion of these antient '*primary*' strata.

On the contrary, among the more recent of the marine strata for example, the eocene tertiary strata of London and Paris, the number of organic fossils is prodigiously great. If these contrasted cases were the only ones which appeared to suggest a law that 'the *number of organic fossils in the strata continually augmented from the earliest primary to the latest tertiary rocks*,' they would deserve attention; but the supposition becomes changed into exact inference by comparing successively the systems of strata on a uniform plan. The table already given in the article GEOLOGY and the remarks which accompany it [vol. xi., p. 148] will illustrate this point.

Such being the facts with regard to the *number* of species of organic remains in the several systems of strata, we may next inquire as to the distribution of the several *kinds* of fossil plants and animals. Taking the broadest view of the subject first, we may represent the distribution of the *classes* of plants and animals in compendious tables. The classification of animals is that used in the 'Cyclopædia of Anatomy and Physiology,' and we include in the term 'Palæozoic,' all the generally argillaceous and arenaceous strata between the mica schist and the old red-sandstone. The asterisks indicate affirmatively the discovery of plants belonging to the classes named in the columns above, in the systems of strata included between the same horizontal lines.

Distribution of the Classes of Plants.

Systems of Strata.	Agamia.	Cryptogamia cellulosa.	Cryptogamia vasculosa.	Phanerogamia gymnospermia.	Phanerogamia monocotyledonea.	Phanerogamia dicotyledonea.
Tertiary . . .	•	•	•	•	•	•
Cretaceous . .	•	—	•	•	•	—
Oolitic . . .	•	—	•	•	•	—
Saliferous . .	•	—	•	•	•	—
Carboniferous . .	•	—	•	—	•	—
Palæozoic . . .	•	—	•	—	—	—
Primary . . .	—	—	—	—	—	—

It is thought by some writers that true dicotyledonous plants occur in the carboniferous strata. It is perhaps uncertain whether the fossil plants of the slaty strata of the Rhine and Brittany are rightly referred by Brongniart to the Palæozoic period.

The reader will not fail to remark that the classes belonging to the columns marked ‡ below, are represented in all the fossiliferous strata, and that they all contain *hard conservable parts*, more abundantly than any other of the classes. They are also principally *marine*, some of them exclusively so. These facts should make us scrupulous in believing that the full system of antient organic life is disclosed to us by the series of organic fossils preserved in the earth.

Distribution of the Classes of Invertebral Animals.

Systems of Strata.	Polygastrica.	Porifera.	Polypifera.	Acalephæ.	Echinodermata.	Entozoa.	Rotifera.	Cirrhopoda.	Annelida.	Myriapoda.	Insecta.	Arachnida.	Crustacea.	Tunicata.	Conchifera.	Gasteropoda.	Pteropoda.	Cephalopoda.
Tertiary . . .	•	•	•	—	•	—	•	•	•	•	•	•	•	—	•	•	•	•
Cretaceous . .	•	•	•	—	•	—	—	•	•	—	—	—	•	—	•	•	—	•
Oolitic . . .	—	•	•	—	•	—	—	—	•	—	•	—	•	—	•	•	—	•
Saliferous . .	—	—	•	—	•	—	—	—	—	—	—	—	•	—	•	•	—	•
Carboniferous . .	—	—	•	—	•	—	—	•	—	—	•	•	•	—	•	•	—	•
Palæozoic . .	—	—	•	—	•	—	—	—	—	—	—	—	•	—	•	•	—	•
Primary . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			‡		‡								‡		‡	‡		‡

Distribution of the Classes of Vertebral Animals.

Systems of Strata.	Pisces.	Amphibia.	Reptilia.	Aves.	Mammalia.
Tertiary . . .	•	•	•	•	•
Cretaceous . .	•	—	•	—	—
Oolitic . . .	•	—	•	•	•
Saliferous . .	•	—	•	—	—
Carboniferous . .	•	—	— ?	—	—
Palæozoic . .	•	—	—	—	—
Primary . . .	—	—	—	—	—

Fishes are the only class of vertebrata found in all the systems of strata. Reptiles begin to appear (if not in the carboniferous system) certainly in the next above. Birds and mammalia appear locally and rarely in the oolitic rocks, and we believe the amphibia (fresh-water tribes of Batrachida) are not known in strata older than the tertiaries. If, lastly, we inquire in what part of the series of aqueous deposits the remains of Man have been found, the answer furnished by modern observation is very different from the fanciful conjectures common in the seventeenth century. Then the remains of men, 'evidences of the deluge' (as Scheuchzer calls his imaginary fossil man, but real fossil salamander!), were supposed to be common in rocks of every age; now we are not able to quote a single authentic example of any such occurrence except in loose surface soil, sand, gravel, and caverns, in which, not uncommonly, pottery, fabricated bones, and other marks of rude civilization accompany the reliques of our progenitors. If this absence of the bones of men from the marine strata were the only evidence which geology had to offer concerning the comparatively late creation of man, we might excuse the singular error which from time to time is revived by speculators little acquainted with the progress of science, the error of attributing to the human race, for whom the present aspect and arrangement of the globe is adapted, the same antiquity of origin as to those numerous tribes of plants and animals which became extinct before the birth of man, and were adapted to other and earlier conditions of the planet.

We may produce a few of the proofs necessary to the establishment of this truth, by determining first, what are the degrees of analogy to existing races presented by the organic fossils of the different systems of strata. As before observed, the remains of terrestrial plants and animals occur too rarely, and in a certain sense too accidentally, in the strata of marine origin to be of much importance in this reasoning. Taking then our examples chiefly from marine tribes, we may state that in the Palæozoic strata none of the species are known to be now living, and about two-thirds of them belong to genera which are also extinct. Among these extinct genera are the whole group of Trilobites, the Clymeniæ, Goniatites, Orthoceratа, Phragmoceratа, &c., Producta, and many lamelliferous corals.

All the species in the carboniferous system are in the same manner extinct, and fully half of the marine tribes belong to extinct genera, often identical with those in the Palæozoic series. Here we find some hundreds of terrestrial plants (Lepidodendron, Stigmaria, &c.), now entirely unknown among the 60,000 which botanists are acquainted with. Nearly the same proportion of the species found in the saliferous and oolitic systems (about 40 per cent.) belongs to extinct genera (all the species being unknown in modern oceans). Among these genera we have the gigantic reptile forms, the Enaliosaurians, the Iguanodons, the Megalosaurus; the countless Cephalopods, Ammonites, and Belemnites; many Crinoidea and Echinida, besides plants approaching to Zamia, Equisetum, and tropical ferns.

The cretaceous system in like manner contains many extinct genera (Mososaurus, Turrilites, Scaphites, Ananchytes, Marsupites, &c.), in which about 40 per cent. of the species yet found may be ranked. All the species are distinct from existing tribes.

But in the tertiary strata, which crown the series of marine deposits, a different result has rewarded the diligent comparison between fossil and recent species. The great number of shells in these deposits gives excellent means of judgment, and M. Deshayes has in consequence been able to establish very exact inferences. In the oldest of the tertiaries ('Eocene deposits' of Lyell) there occur from three to five per cent. of existing species. In those of middle age ('Meiocene deposits') from 7 to 28 (averaging 18 per cent.); but in the uppermost series of tertiaries ('Pleiocene deposits') from 40 to 95 per cent.

Thus by estimates, as exact as can be made, of the whole number of species, geologists are enabled to perceive clearly that the affinity between fossil and recent species of animals and plants is greatest in the most recent strata, least in the most antient, and in general is *inversely* proportional to the antiquity of the strata. Not only man is absent from the fossil world of life, but nearly all the actual creation is wanting there, and is replaced by the relics of other and earlier creations.

By considering and comparing the organic remains which fill the successive systems of strata, we find that, as few living forms appear among the lower tertiaries, few or none of the tertiary forms appear in the lower parts of the cretaceous system: this system is in the same manner distinct from the mass of the oolites, these from the red-sandstones, the latter from the carboniferous rocks, and all from the Palæozoic groups. (For proof of this, compare the following works, namely—Murchison's *Silurian System;* Phillips's *Mountain-Limestone Districts of Yorkshire;* Smith's *Strata Identified;* Mantell's *Geology of Sussex;* Deshayes's *Tertiary Fossils.*)

Each of these systems of strata contains the reliquiæ of animals and plants which were in existence in the sea, in fresh waters, or on the land, at or previous to the time of the production of those strata; and, by combining the evidence derived from all, we arrive at a view, incomplete indeed, yet not necessarily inaccurate, of the *succession of organic life upon the globe.*

It is perhaps a common opinion that the earliest forms of life, those which occur in the fossiliferous primary (or Palæozoic) rocks, are of simpler organization than such as belong to later periods; and a conjectural view of the succession of organic life on the globe obscurely hints at a gradual 'perfectionnement' of the animal and vegetable organizations in proportion to the elapsed time. In favour of this view, the first occurrence of fishes in the uppermost

of the Silurian strata, and the first occurrence of reptiles in the lower beds of the magnesian limestone formation, deserve consideration. But on the other hand, it is not to be concealed that the earliest fishes which do appear exhibit analogies to reptile structure, and betray no mark of inferior organization; and the earliest remains of reptiles belong to high grades of that class.

On referring to the most antient known British fossils, those few which lie in the slates of Snowdonia, we find them to consist of lamelliferous *Polypiaria* and *Brachiopoda*, such as Lingula, Producta, and Spirifera—a small assortment certainly, and thus perfectly in harmony with the view of the gradually increasing numerical amount of fossil forms already explained, but not such as to justify a statement of their inferiority of organization. In the next stage of organic life, the Silurian system, the fossil species amount to several hundreds (at least 600), and among them are many *Polypiaria*, many *Echinodermata*, *Brachiopoda*, and other *Conchifera*, *Gasteropoda*, and *Cephalopoda*, with *Crustacea* and *Fishes*. It cannot be said that these organizations, compared with others of the same class now living, are, in any just sense, inferior or less complex; nor do we find reason to qualify this assertion while reviewing the similar and larger series of fossils from the carboniferous system, in which *Fishes* become numerous and varied in structure.

It is needless to pursue this discussion through the superior stages of the strata, in which the introduction of *Reptiles* and the development of the several classes of animals continually augment the analogy to the existing system of nature. The general result of this whole discussion, if we had room to pursue it, would be to establish the fact of the successive introduction of all the classes and most of the great divisions of marine animals in the successive geological periods, not by the improvement or expansion of one original general type, but by addition of *new organizations* to meet *new physical conditions* of the globe.

This important result, which presents to us a series of great revolutions in organic life anterior to the desiccation of our present land (which is the bed, or rather exhibits many successively obliterated beds, of the antient seas, with their extinct inhabitants), and adapted to the chain of physical phenomena which preceded and prepared the actual arrangements of nature, may be confirmed by a brief notice of the duration of certain extinct races. By this expression it is not meant to state or to insinuate definite periods of time, but the space occupied on a scale of successive geological events, by the whole traceable duration of particular races of animals. For this purpose we shall take two genera of Brachiopoda (Producta, Spirifera), four of Cephalopoda (Goniatites, Orthoceras, Ammonites, Belemnites), three of Crustacea (Calymene, Asaphus, Glyphia), three of Fishes (Holoptychus, Palæoniscus, Tetragonolepis), and three of Reptiles (Ichthyosaurus, Pterodactylus, and Mososaurus). The systems of strata being, as before, represented by horizontal lines, and the particular fossils ranged in vertical columns, the asterisks denote the occurrence and geological duration of the groups.

Systems of Strata.	Producta.	Spirifera.	Goniatites.	Orthoceratites.	Ammonites.	Belemnites.	Calymene.	Asaphus.	Glyphia.	Holoptychus.	Palæoniscus.	Tetragonolepis.	Ichthyosaurus.	Pterodactylus.	Mososaurus.
Tertiary . . .															
Cretaceous . .					•	•									•
Oolitic . . .		•			•	•			•			•	•	•	
Saliferous . .	•	•			•						•				
Carboniferous . .	•	•	•	•				•		•					
Palæozoic . .	•	•	•	•			•	•		•					
Gneiss, &c. . .															

Here then is a representation of very numerous facts known to geologists, which demonstrate that each *group* of *extinct organization*, each *genus* of such a group, each *species* of such a genus, has a definite geological range, appears at a particular point in the scale of geological events, and ceases at another point. From these facts, investigated and collected, it is a clear and positive inference that, during the period which elapsed in the production of the stratified rocks, many combinations of animals and plants—in this sense many systems of organic life—came into being and passed away, not by violent catastrophes or universal revolutions, but by partial substitutions distinctly traceable, often coincident with or consequent on changes of the strata, and more or less referrible to previous remarkable changes in the physical condition of the globe.

From such a view, which we regard as fully established in truth, the 'identification of strata' by organic remains (as geologists, following Dr. William Smith, term the employment of zoological and botanical evidence to determine the geological age of formations or systems of strata) follows as a natural and simple consequence. But in employing this powerful instrument of research, geologists must not overlook ascertained facts which limit the extent and modify the rigour of the application:—

1. The geographical area within which any one species of fossil has been found is limited, and seldom (except in the Palæozoic strata) extends beyond a few degrees of latitude and longitude. (The same thing applies to living species.)

2. The geographical range of fossil genera and larger groups is much greater, but their geological range is also greater, and the evidence which they furnish of geological age is diminished in precision.

3. Difficulties hence arise of a very serious nature where strata really contemporaneous, or nearly so, but widely separated (as in North America and Europe), are to be compared. Of 100 species of fossils found in the cretaceous rocks of America, only two or three are identical with European species in the same rock.

4. In all cases where distant deposits are to be classed in age by their organic contents, a prudent geologist will not decide by what is called a *characteristic fossil*, since this may only have a local value; he will not be satisfied with a few fossils of one genus or group; he will not pronounce a positive opinion, unless several species of characteristic groups, and belonging to different organizations, are presented for examination. On such evidence, embodying the *characteristic combinations of organic life* for each geological period, a just and secure inference may rest, and thus employed, 'organic remains' become a clue to many of the darkest pages in the antient history of our planet.

ORGAN, CONSTRUCTION OF. We have on record several kinds of organs—the Hydraulic, the Pneumatic, the Barrel, and the Finger or Church organ.

Of the hydraulic organ we know little beyond its having been operated on in some way by water: it probably resembled the clepsydra, or water-clock, which chimed at certain hours. The pneumatic organ, whether more or less antient than the hydraulic, was certainly the parent of the present finger organ; but it was so decidedly rude in its construction, that it must always be considered as a distinct instrument. The barrel organ is a machine with little variety and no expression; it nevertheless contains many clever contrivances, and is daily receiving improvements. The present finger organ is the largest and noblest of all musical instruments; its power is that of a full band, and for delicacy and sweetness of tone it is unrivalled.

A complete and full finger organ should have *three sets of keys*, and at least *two octaves of pedals*.

The first set of keys takes the *swell*, the second the *great organ*, and the third the *choir*. The compass, as well as the size of organs, must depend upon circumstances. The German scale or compass is CC to F in alt; the English descend to G below, and in some organs as low as CCC, which, for duet and solo performances, is certainly the best. A good swell is always important to an organ, and we should recommend CC to F in alt as the compass to be

preferred. The compass of the choir is generally the same as that of the great organ. These several parts, or organs, when brought together by stops, called *couplers*, give to the keys of the *great* organ the command of *every pipe in the instrument*, the power and majesty of which are without parallel in instrumental combinations.

Figure 1 is a section of a large organ, showing the several situations of certain principal parts of the instrument, which are variously placed however by different organ-builders. A is the *swell-box*, which is usually made of deal, and the thicker the better, but it certainly should not be less than an inch and a half in thickness: it must be lined with paper or leather to deaden the tone when shut. The front is formed of *Louvre*-boards, all of which are made to move on centres; they must also be an inch and a half thick. The performer opens them by a pedal expressly employed for opening and shutting the swell. This kind of front is what is known by the name *Venetian*. B is the choir *sound-board*, or part in which the pipes of that part of the organ are placed; C is the great organ *sound-board*, which also contains its pipes; D is the *bellows;* E is the *pedal sound-board*; F is one of the front pipes, to which the wind is conveyed by metal tubes called *conveyances;* G G G are three roller-boards, one for each organ; H is a *tracker*, used with *squares* and *centres* to reach distant parts of the action; I is the *keys;* K is the *pedals;* L is the seat. The numerous things which are not indicated in this figure must be sought for in *working* drawings, as we cannot and do not pretend to give these matters a practical form.

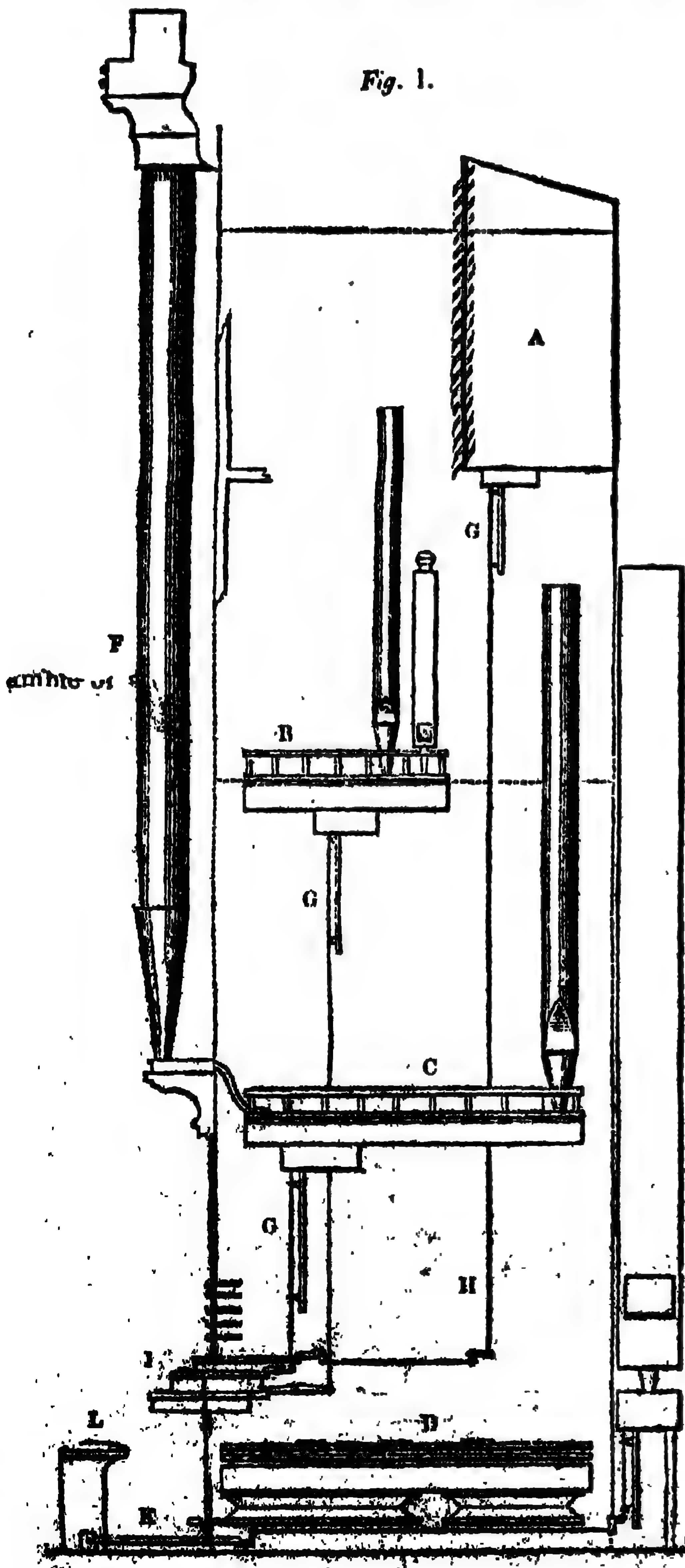


Fig. 1.

Figure 2 represents the present *bellows*, known under the name of *horizontal bellows*. A shows the *reservoir;* B, the deep frame through which the wind is taken; C, the part moved in blowing, called the *feeder;* D D, the *registrars*, by which the equal rising of the reservoir is ensured: there are valves inside for receiving and retaining the wind, all of which are differently constructed by different builders.

Fig. 2

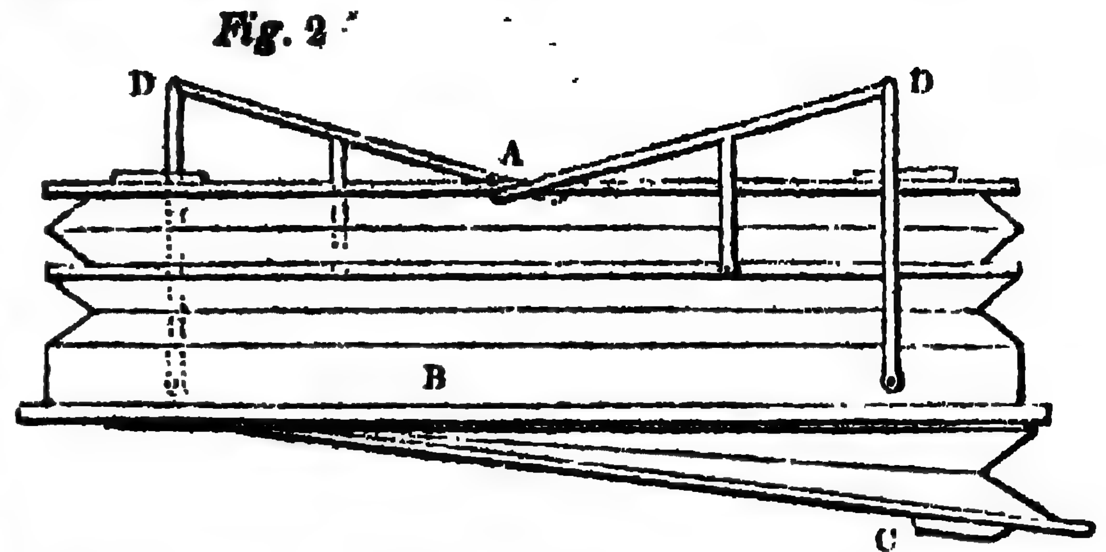


Figure 3 is a perspective view of a *roller-board:* A A A, the board on which the rollers are fixed; B, three pull-downs, explained below; C C C, rollers centred at each end into small blocks, in which they move; there are also *arms* to each end, in front, connecting the rollers with the keys and the wind-chest; D, the levers which are connected with the keys and the pull-downs, and are longer or shorter as may be required; they are also *parallel* or *fan-like*, to suit their position.

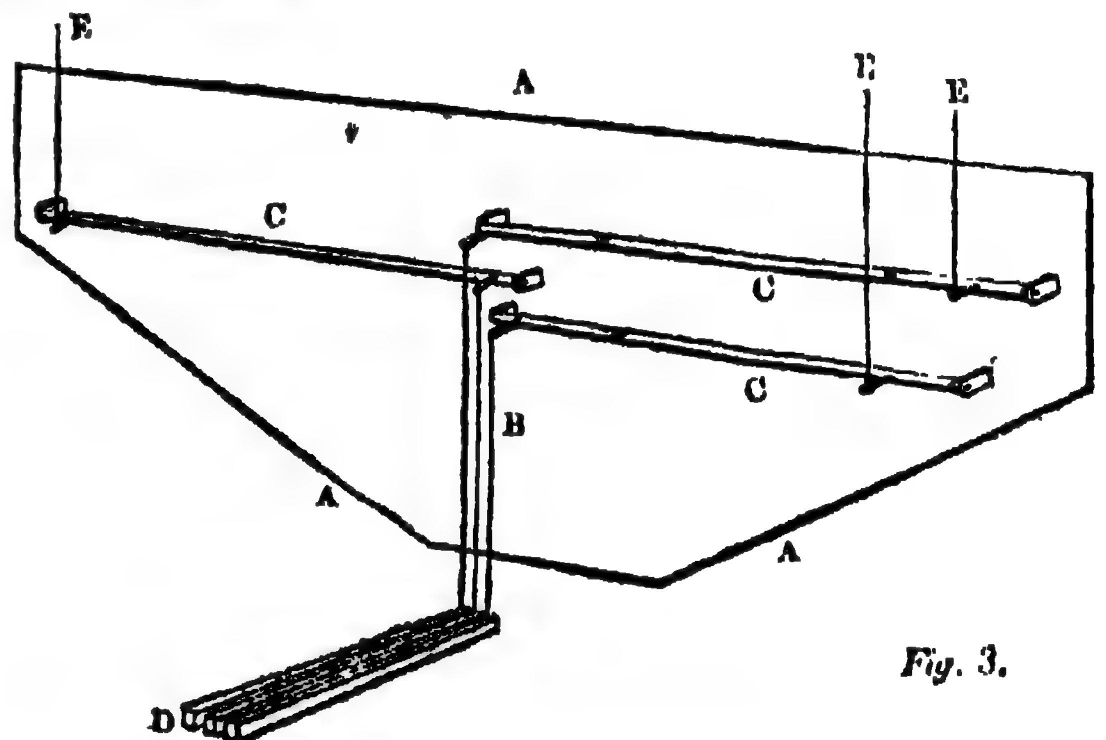
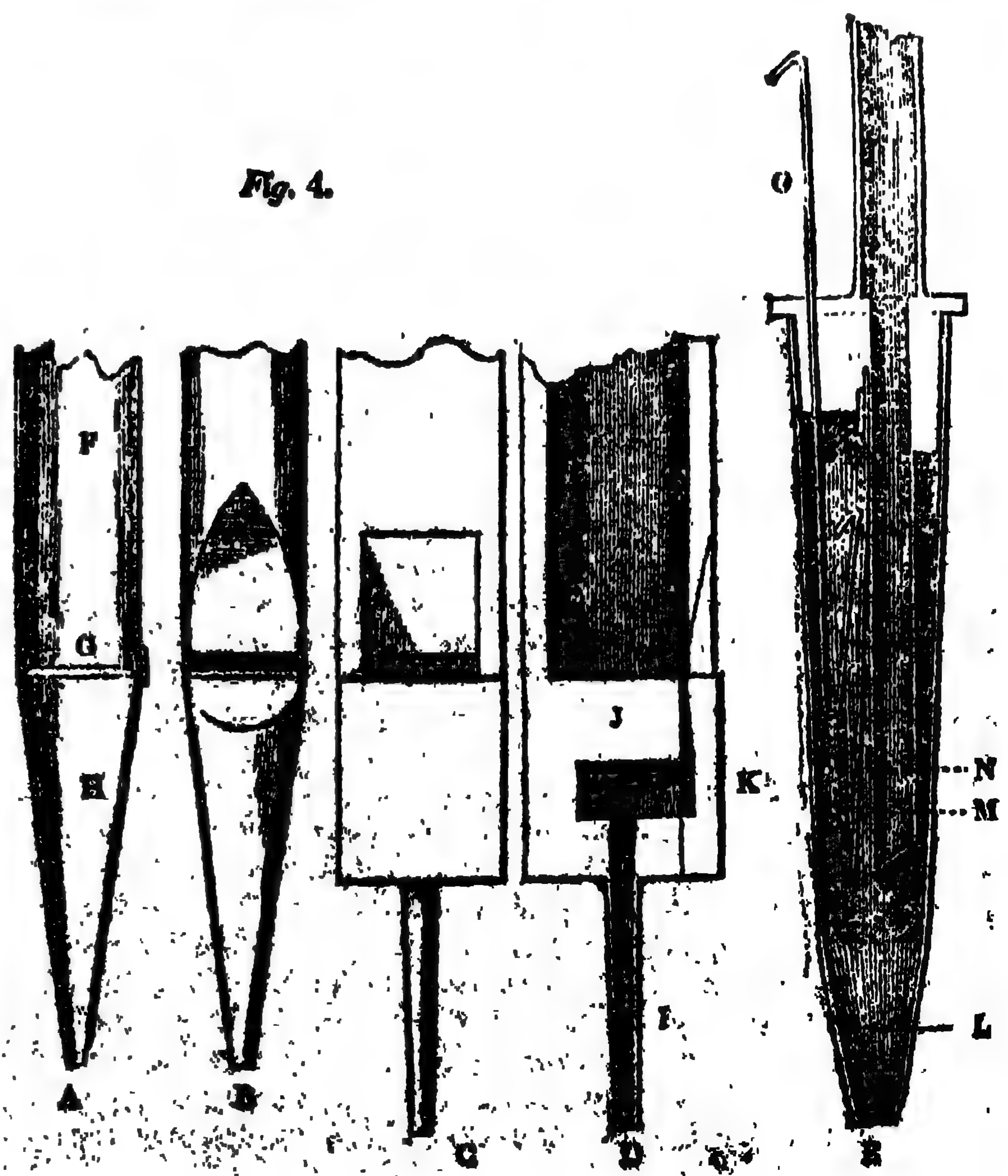


Fig. 3.

Figure 4 contains a few examples of pipes. A is a metal open pipe; F, the sounding part; G, the part called the *language*, and H, the *foot;* B is the same pipe, show-

Fig. 4.



ing the *mouth* and the flattened part for *voicing*; C is a front view of a *stopped diapason* pipe; D is a section showing the arrangement of its construction; I is the *foot*; J is the *block*, and K is the *cap*. E is a section of the voice part of a *reed* pipe. L, the *foot*; M, the *mouthpiece*; N, the *reed*; and O, the spring. The pipe itself is made of metal composed of tin and lead; the *reed* is brass, and the *spring* is soft steel wire, about a tenth of an inch in diameter. This form of reed pipe is the basis of all the others, their differences being more in shape than in principle. When speaking of the lengths of pipes, it is generally with reference to *tuning* or *pitch* C, which is one foot long: and *all* C'*s below are doubled* as we go from 1 to 2, 2 to 4, 4 to 8, 8 to 16, and 16 to 32; the last, although little used in this country, gives the highest rank to organs.

Speaking Lengths and Semidiameters of Stops.

	Open Diapason,	Principal, and	Fifteenth.
	FFF	FFF	FFF ....
	GG	....	....
8 foot pipe.	CC, ... 8 feet....	CC, 4 feet......	CC, 2 feet.......
	FF	....	....
	G ..... Gamut...	....	....
4-foot pipe.	C...... Tenor ...	C pitch, 2 feet.....	C, 1 foot. ... ..
	F	....	....
	G ...... Fiddle?..	....	....
2-foot pipe.	C...... Middle .	C middle, 1 foot....	C, 6 inches.........
1 foot pipe.	C..... Above...	C above, 6 inches ..	C, 3 inches.........

Centre to the above Semidiameters, which are real dimensions. This centre must be ¼ an inch below the first dot.

This Table shows the relative lengths and diameters of the open *diapason*, the *principal*, and the *fifteenth stops*, as high as C above middle C.

Quints, *twelfths*, and *sesquialteras*, all take the sizes and lengths of their proper tones in the open diapason. *Trumpet* and *Oboe stops*, being what are called *unison stops*, also take their lengths from the *open diapason*. The *clarion*, an octave stop, is measured by the *principal*. The bells of all *reed-pipes* should be as large as their places in the organ will admit of.

Middle C in the *dulciana* is an inch and a quarter in diameter and about two feet two inches long. A large size stop-diapason is seldom pure and musical. An inch and eighth wide and an inch and three-eighths deep, with thirteen inches in length, is a good scale for a *middle* C *stop-diapason pipe* in wood. Scales may be taken of larger or smaller dimensions, if desired, in which case the larger must be shorter and the smaller must be longer. Where stops are repeated, two or three of the same scale, it is thought better to have them of different diameters, from an opinion that two or more unison-pipes of the same diameter affect the ear only as one pipe. There is something in this [illegible], but how much we will not venture to determine.

Figure 5 is a section of a *sound-board*, showing some part of the mechanism. A is the *rack-board*, by which the pipes are held in upright position; B shows the ends of the slides; C, that part of the sound-board which contains the *channels* for conveying the wind to the pipes; D, the pallet or valve which is opened by the finger of the organist, through the *key*, the *lever*, the *pull-down*, and the *roller* (see *figure* 7); E is the spring which keeps the pallet in its place when not in use; F is the *pull-down*, having a small screw and a leather button at one end, and a piece of hard bell-wire at the other; the former is fixed to the *lever*, and the latter to the *arm* of the *roller*; G is merely one end of the roller-board.

Fig. 5.

Figure 6 represents a *draw-stop*, a *trundle*, and a *lever*, all of which are used by the organist in changing a stop or slide; A is the *draw-stop*; B is the *trundle*; C is the *lever*; D is the *slide*. The draw-stop is linked to the trundle at E, the trundle is linked to the lever at F, and the lever is fitted to the slide at G. Their centres are all at H. In connection with the above, there are also pedals called *composition pedals*, three, four, and five to an organ.

Fig. 6.

Figure 7 represents certain small parts of the action. A is the wire by which the pallet is opened; B is the pull-down attached to it: C is the pallet-end of the roller, with its fixing to the board; D is an end view of a roller, with a pull-down and lever, all in their relative connection; E is the pull-down, and F is the lever, to which the key follows; G is a common form of a *square* or *centre*, by which the trackers are united. *Trackers* are pieces of pine wood, ⅜ of an inch wide, and from an ⅛ to a ¼ thick; they are of different lengths, and may be used to any extent. The

Fig. 7.

Birmingham organ is said to have [illegible] trackers, in [illegible] they are employed to remove the keys to a distance from the instrument, which is done to the extent of ninety feet. H is the [illegible] of a pedal-key; I is the *sharp*, and H is the *natural*. The length is about two feet; the distance from centre to centre of each pedal is two inches and a half.

Figure 8 represents an *anemometer*, or wind-gage. It is a glass tube bent as in the figure: the dark part is supposed to be water. A is the place to which it is applied to the organ, which is generally the hole for the pipe used as the pitch A or C. The pressure of the wind at B drives the water up to C, and the measure of their difference is what is called the *wind*. Some organs have more, and some less; two inches and a half is the common measure. The organ at St. Paul's cathedral is said to have as much as three inches.

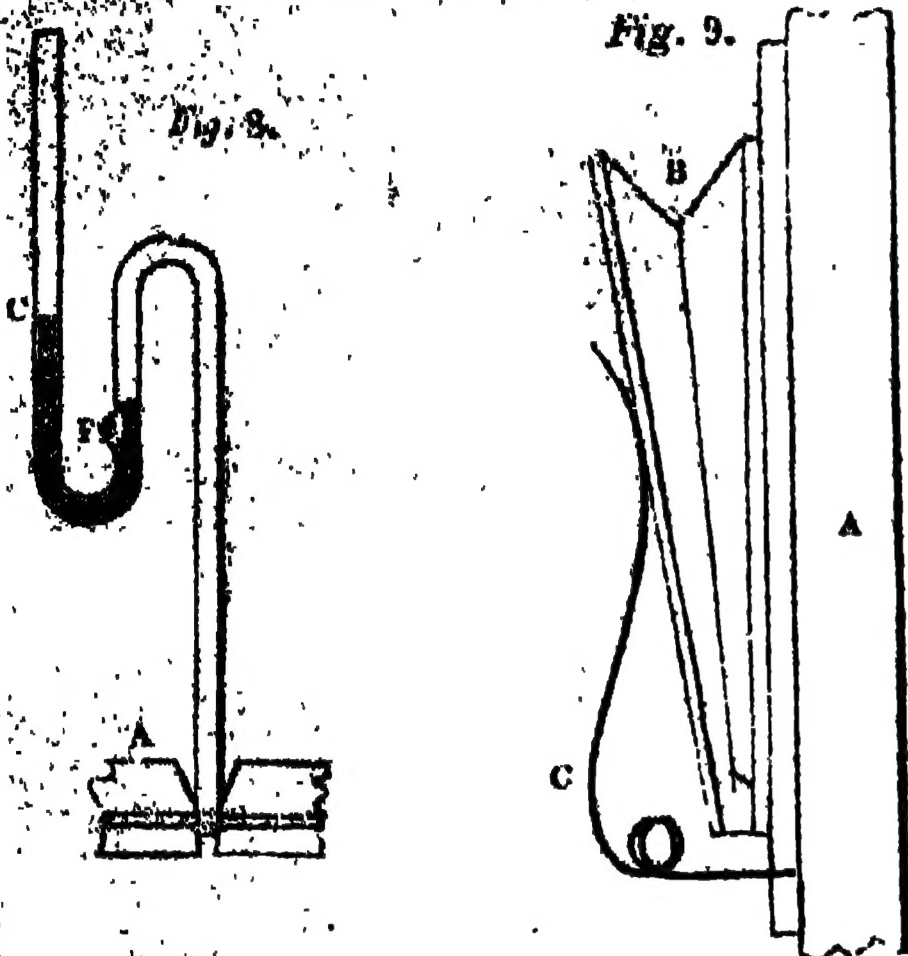
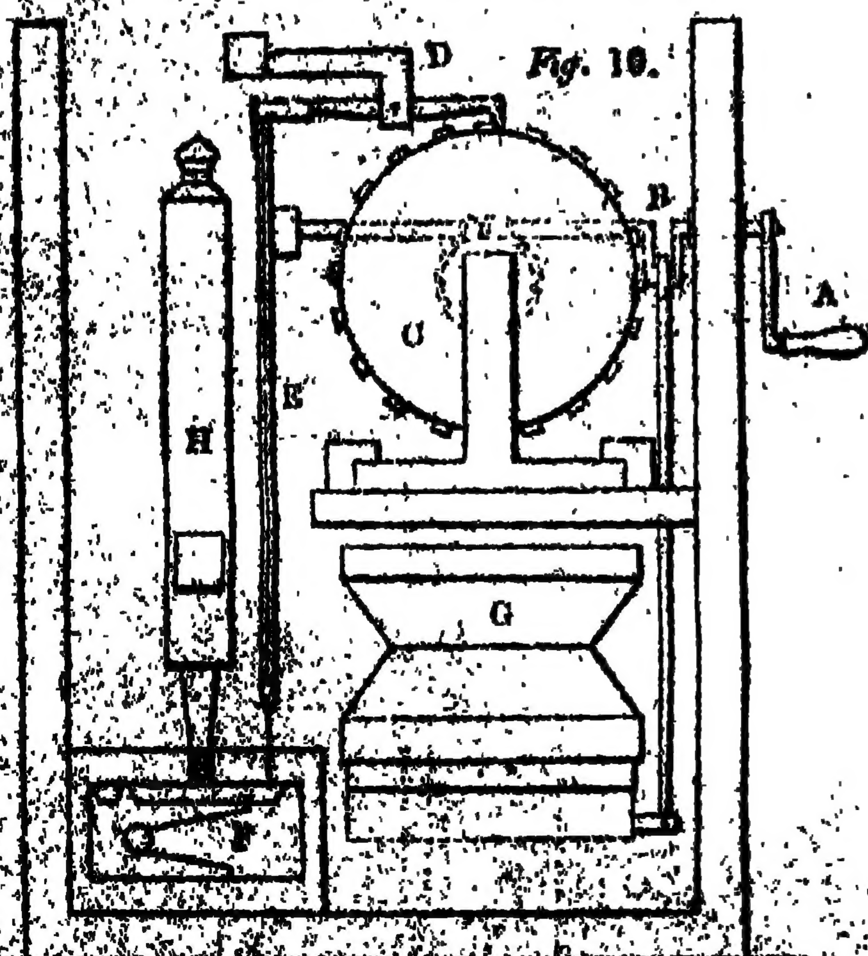


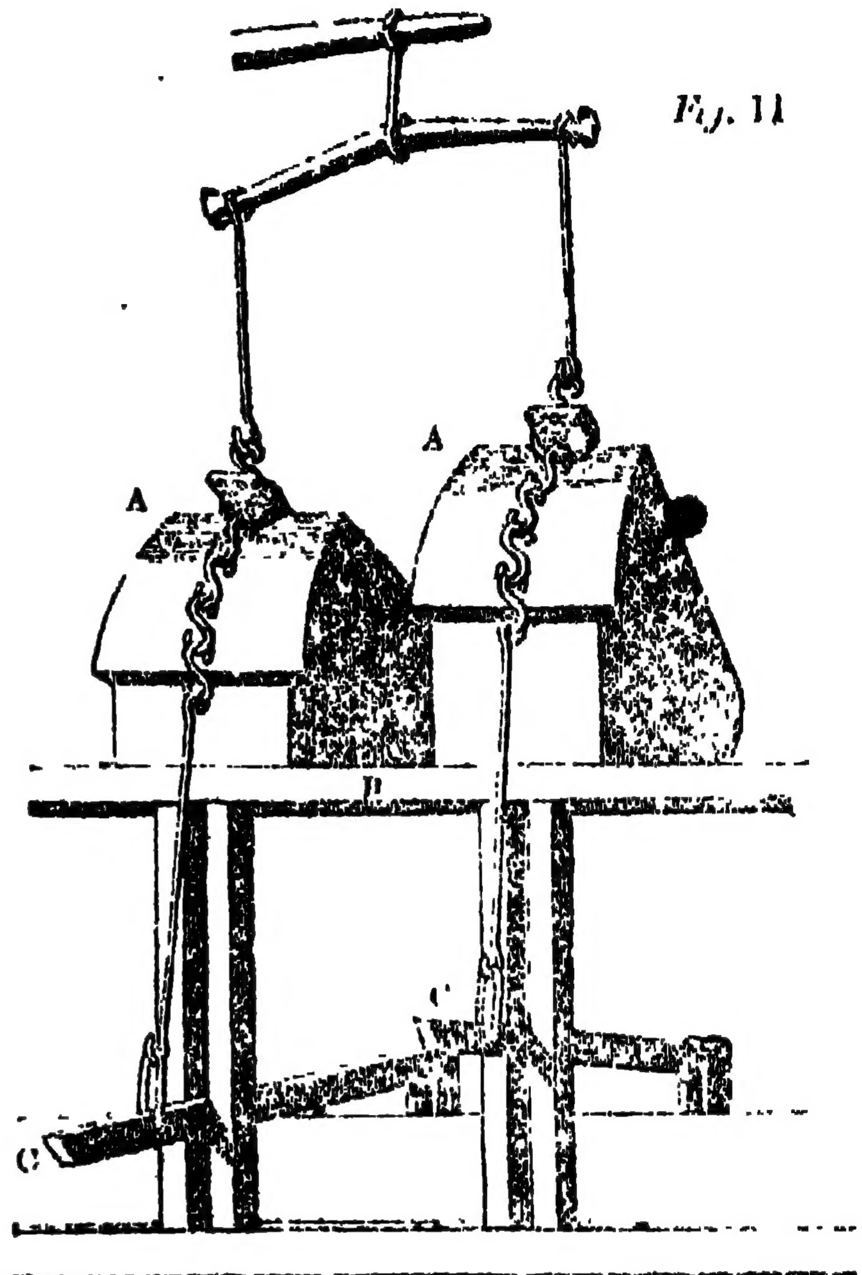
Figure 9 represents a percussion valve. It may be said to be a small bellows pressed by a spring. A is the wind-trunk, to which it is fixed; B is the valve itself, and C is the spring. The use of this part of an organ is to steady the wind, which is sometimes disturbed by sudden transitions or very rapid performance: the spring of the valve is regulated so as to give way on such occasions and to moderate their effects.

Figure 10 is a section of a common barrel-organ. A is the handle; B, the *worm* and *crank*, which move the *barrel* and *bellows*; C is the barrel on which the tunes are set. The setting is effected by brass pins and staples driven into the barrel at proper distances, accordingly as the notes are longer or shorter. D is the key, the rising of which over



the pipe causes it to press down the sticker (E) into the wind-chest (F), and thus to open the pallet for the wind to enter the pipe above; G is the bellows; H, a stop-diapason pipe. This diagram shows only one barrel, which is the common plan, but Messrs. Gray and Co. have lately introduced three, by which great risk to the mechanism is avoided and much trouble is saved. The celebrated Apollonicon, invented by Messrs. Flight and Robson, reflects high credit upon the builders, but we very much doubt its real claim to be ranked among musical instruments. Its introduction into churches should be sparingly encouraged, or it will certainly endanger both the pleasure and the practice of music.

Figure 11 represents the only known form of *bellows without leather*, and this we have found in Swedenborg's 'Opera Philosophica.' A A are the bellows, which consisted each of two boxes, an upper and a lower, the upper



shutting over the lower; B, the bar on which the blower is held; CC, the levers on which he alternately stepped or jumped to put them in motion. How far we are correct in the adoption of this figure has yet to be proved. The manner of working such bellows has been sufficiently described in early writers, but their construction has been entirely overlooked, except by the above-mentioned author.

The tuning of organs is a subject on which there is much difference of opinion. Some tune from C, and allow of what is called the *wolf*, a discordance arising from the extreme flatness of some of the fifths. Others tune from A, and adopt the *equal temperament*; this latter certainly has the better reasoning in its form, as it approaches nearer to the human voice, interferes less with the band, and is more agreeable in general modulation. This subject has been minutely handled by certain curious and scientific men who have given themselves the trouble of what may be called *splitting* octaves into *smaller intervals*. But the advantages of this minuteness have not yet extended beyond the schemers themselves, for not one of their methods has yet left the cradle of its birth. The Temple organ is said to have 14 sounds in the octave; the Foundling 16, Hawke's patent 17; Loeschman has 24, and Liston's enharmonic organ as many as 59, of which 24 are on the keys, and the rest on the pedals and other contrivances. If such schemes were to become general, they would make practical men tremble; but *flat fifths* are still in use notwithstanding the enharmonic divisions, and they have nothing to fear beyond an occasional dispute on the subject.

The numbers and kinds of stops are matters not subject to rule; they vary in almost every organ, and seem more under the command of circumstances, such as space and price, than any other parts of the instrument.

END OF VOLUME THE SIXTEENTH.

Printed by [illegible]